TRANSACTIONS

OF THE

California State Agricultural Society

DURING

THE YEAR 1874.

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ANNUAL MEETING

OF THE

STATE AGRICULTURAL SOCIETY.

STATE BOARD OF AGRICULTURE FOR 1874.

PRESIDENT.

R. S. CAREY ..... Sacramento.

DIRECTORS.

J. J. GREEN ..... Sacramento.
CHRIS. GREEN ..... Sacramento.
ROBERT HAMILTON ..... Sacramento.
M. D. BORUCK ..... San Francisco.
FRED. COX ..... Sacramento.
MARION BIGGS ..... Butte.
COL. C. YOUNGER ..... Santa Clara.
T. L. CHAMBERLAIN ..... Placer.
E. B. MOTT, JR ..... Sacramento.

OFFICERS OF THE BOARD.

Secretary ..... ROBERT BECK, Sacramento.
Treasurer ..... L. A. UPSON, Sacramento.

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ANNUAL MEETING.

The State Agricultural Society held its annual meeting at the Pavilion, January twenty-seventh, at two o'clock P. M. There was a very large attendance—the assemblage being composed of leading citizens of the State and Sacramento City.

President Carey called the meeting to order at two o'clock P. M., and called on Director Boruck to read the annual report of the Directors. Mr. J. A. Duffy moved to dispense with the reading of the report. The President said it was the desire of the Board that the report should be read. On division, the motion prevailed. The reading of the financial report, on motion of Judge Clark, was dispensed with, and on motion of L. A. Upson, it was referred to a committee of three to be audited. The Chair appointed Julius Wetzler, James Carolan, and G. W. Chesley as such committee.

The next business in order was the election of President.

Mr. Boruck in the chair.

Grove L. Johnson said the society is in the situation of having a debt to pay; a debt to the people to pay, to keep the society a pride to the State. It has a debt financial also. He thought a ransom should be paid for a good President to discharge it, and he therefore nominated Ransom S. Carey as President of the society, believing that the people would be gratified by his choice, and the creditors of the society rest sure in the faith that the debts will be paid.

On motion of James A. Duffy, the Secretary was authorized to cast the vote of the members for R. S. Carey, which being done, Mr. Carey was loudly called for, and, as he ascended the stand, was received with warm applause.

Mr. Carey returned his thanks for the honor conferred. He had served, he said, ten years in the Board—two years as President. He hoped to serve two years more. That was laying the groundwork for another year. His reason was, when he entered office the society was in debt. When he went out of office the first time the society was clear of debt. Now it is in debt twelve thousand dollars; but he was glad of it, proud of it, for there was something lasting and useful to show for it. His ambition now was to discharge that debt and leave the society its property untrammeled. When that was done he would trouble the society no more by filling a position on its Board. He had always

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labored for the good of the society, as much so when a Director as when President, and it never should be said that his position influenced his zeal.

The next order was the election of three Trustees, in place of Robert M. Hamilton, J. J. Green, and Chris. Green, whose terms expired.

Grove L. Johnson nominated the same gentlemen to serve again, that the President might have the same supporters to aid him in his work. No other nominations being made, on motion of James A. Duffy, the Secretary was ordered to cast the vote of the members, which being done, loud applause followed, and the nominees were declared unanimously elected. The society then adjourned *sine die*.

REPORT OF THE BOARD OF DIRECTORS.

To the members of the State Agricultural Society:

Gentlemen: In laying before you our annual report of transactions and financial statement for the year just closed, we congratulate members of the society upon its progress in usefulness and prosperity; upon our increased facilities for encouraging every worthy industry; upon the success which has crowned the efforts of the society in all its undertakings; and upon the general appreciation of the value of our organization to the entire State. And we desire to congratulate the people of California upon the strong and steady growth that has marked every leading agricultural and stock interest during the past season, and has generally characterized all the minor branches of industry, as well as upon the promise of the new year, which seems to give a plain assurance of abundant harvests, the establishment of new and important industries, a rapid development in enterprises that have heretofore been experimental, and an unprecedented advance in wealth and population.

In the volume of transactions to which these paragraphs are prefatory, will be found synopses of the results attained in agricultural and kindred pursuits since the date of our last report; a variety of valuable and special information; tabulated details of receipts and expenditures; a full exhibit of proceedings at the Pavilion and at the stock grounds during the recent Fair; and many selected papers of especial value.

It would be superfluous to paraphrase the mass of such information for the purposes of this report, the province of which is more properly to deal with the business management of society affairs; but it may serve a useful purpose to summarize a few results, and to touch briefly upon some topics of general interest and increasing importance.

FINANCIAL.

Owing to the liberality of the Legislature, and the success which has rewarded our business efforts, we have been enabled to make very extensive improvements at the Fair grounds, some much needed alterations and repairs at the Pavilion, and to report a favorable financial condition.

Our expenditures for the year amount to	$65,789 43
Our receipts aggregate	66,650 85
Leaving balance in the Treasurer's hands	$861 42

THE WHEAT CROP.

The wheat produced, sold at home and abroad, and stored to await domestic consumption or transportation, during the year just closed, amounts to fully forty millions of bushels. This is an increase of thirty-three per cent over the preceding year, and places us first in the list of wheat-producing States. It is peculiarly gratifying to record the fact, for the reason that this important cereal is, in a great degree, an index to the volume of our agricultural prosperity; a large crop successfully harvested being sure evidence that other crops, both cereal and root, of less value and of minor importance, have been fully as prosperous, and have largely increased our material wealth.

As a rule, the fields have been quite free from smut, rust, or anything that might diminish their yield or injure the quality of the grain; the evidence of which is readily seen on every table at home, and in the price lists of all our foreign markets.

WOOL.

Remarkable progress has been made since the year opened in sheep breeding and wool raising. Much attention has been given to the improvement of stock and fleeces. Importations of French and Spanish Merinos, Southdown, Cotswold, Leicester, Shropshire, and other choice breeds, have been continuously made, and by judicious crossing the staple has been perceptibly improved. It yet remains true, that our growers have not succeeded in generally producing the character of wool that meets with the most ready sale—long stapled, well conditioned, and of medium grade.

Notwithstanding our greatly increased product—nearly, if not quite, one fourth of all raised in the United States—no accumulation has resulted, except during the last three months; but Eastern buyers and home dealers have, as a rule, kept the market bare and prices satisfactory.

About seventy per cent of all our wool graded in eighteen hundred and seventy-four, ranked as pronounced first class, and the remainder was classed as but little inferior. This proportion and classification having now been maintained for more than five years, may justly be considered well established.

The increased demand for valley land and rich soil for grain raising has had the effect of forcing flocks to pastures more remote from market centers, and perhaps less luxurious in feed; but the Spring clip was as satisfactory in quality as it was remarkable for volume, and the Fall clip doubtless owes its apparent deterioration to the general practice of shearing too injudiciously and too hastily, in the endeavor to market at attractive prices. It is worth while to suggest that our almost boundless facilities for sheep raising and wool producing have thus far been only partially made available. We can point with a just pride to the commanding position we have attained in respect to quantity, but the quality, while excellent in many respects, is yet open to fair objections from dealers who buy for particular purposes. The subject has been given such intelligent attention by those who are immediately interested that we do not deem it advisable to discuss it at length in this report; feeling assured that the exact length of staple, and precise degree of

fineness, or coarseness, demanded by visiting buyers for the different manufacturers, will eventually be understood, and produced if possible.

ANGORA GOATS.

It has been proved by experiments that the wool-bearing goats can be not only successfully raised here, but can also be made very profitable. The best writers upon the costly fabrics of Cashmere, and the Thibet and Angora goats, agree in stating as an important fact, that the hilly regions and mountainous districts of warm countries produce the best fleeces. We have such localities in abundance, and have already repeated here the proof obtained in South Carolina and elsewhere, that the offspring of the pure imported Asiatic breed and our common goat yield a fleece that closely approximates in fineness and durability to the very best specimens. Also, that such a breed is vigorous and hardy, superior as lamb or mutton for the table, not liable to injury from changing temperatures, easily sustained upon pastures suitable to no other valuable purpose, and free from any known disease. The probabilities are strong that many flocks of these valuable animals will be raised here within a short period of years.

THE VINTAGE.

A failure in the vintage was at one time during the year thought possible, but happily nothing of the kind occurred. The amount of wine made is about equal to that of the preceding year—ten millions of gallons; and the quality is, on the whole, superior. Viniculturists are increasing in number, and the wine processes best suited to the peculiarities of our grapes are becoming better known. If we could succeed in generally bringing our red wines up to the standard of our white ones in body and flavor, little would remain to be learned. Renewed and very successful attempts at raisin making are worthy of record, and the outlook for this branch of husbandry is very favorable.

COTTON.

Nearly one hundred pages of our last report were devoted to cotton, and its adaptability to our soil and climate. The experiments already made, and results arrived at, leave no room to doubt that cotton can be cultivated successfully, and with great profit, free white labor alone being employed, throughout a vast area of our State. The soil has been thoroughly tested, the climate fully proved. Those who ventured to act as pioneers to determine the question, at their own cost and risk, have uniformly made financial successes, and have generously published to the world the details of their experiments. These proofs of assured success are convincing. They may be subjected to the closest analytic criticism without disturbing their accuracy, or weakening their value. Believing that the planting of cotton is destined to become one of our foremost industries, and realizing that the production of it is of great prospective importance and value, both for exportation and for the establishment of factories at home, it gives us pleasure to state that our planters have been uniformly successful during the past year.

SILK.

Although the epidemic disease known as "pebrine" has certainly prevailed among our silkworms in eighteen hundred and seventy-four, and it is becoming known that sericulture here can be made more profitable by producing raw silk or cocoons than by preparing eggs to sell abroad, we feel justified in reiterating that our foothills and valleys are capable of producing the best possible food for the worms, and are peculiarly adapted, by reason of climatic conditions, to the production of silk. The continuous study that has been given by our own able and close observers to this exceedingly interesting industry, has already supplied us with a large fund of valuable knowledge, the most of which may be found embodied in the reports of this society. Among the exhibitions of especial interest lately made at the Pavilion, was a large display of various ribbons, manufactured in Alameda County, from silk raised in California.

FIBROUS PLANTS.

The ramie plant, flax, jute, and hemp, deserve more attention than they have heretofore received from our cultivators, and we are glad to be able to report an increasing interest throughout our farming community in relation to them. They all flourish well here, are profitable to cultivate, and are of leading importance to us as a people. The sacking of grain alone has always been a vast expense, and a serious one, to the producer. Probably our system in this respect must remain unchanged, although it may be modified, for many years to come. If we succeed in raising our own raw material therefor—and there is no reason apparent why we should not—and shall work it up at home, the result will be a neighborly exchange of values, instead of a tax paid to India and Scotland. About six millions of grain sacks were manufactured here in eighteen hundred and seventy-four, yet our producers, probably, sent three millions of dollars abroad to purchase the needed supply of them. A satisfactory showing for foreign manufacturers, but a poor one for us.

The linen factory recently established will, no doubt, fully succeed as an enterprise. It has long been known that flax grows abundantly and matures well in a variety of localities throughout the State. Hitherto it has been raised for seed and oil purposes alone. We are confident that experiments in utilizing the fibers will prove their excellence, and that linen factories will multiply.

TOBACCO.

A large acreage of tobacco was planted in eighteen hundred and seventy-four, and in every case a good crop was obtained. Shipments of the raw material for treatment in Kentucky and elsewhere, were made in a few cases, but the great bulk of it was placed in our home market in the manufactured state, so excellent in quality, and so finished in treatment, that both surprise and enthusiasm were created. Plantations have been projected for the coming season that promise a large yield in eighteen hundred and seventy-five.

FRUITS.

The reputation of California for fine fruits and berries has been largely enhanced by the successful preserving processes which have been put in operation here, and are becoming general. It was our intention to exhibit the Alden process, in full operation, at the recent Fair, but so great was the demand on the resources of the manufacturers, by actual buyers, that we failed to procure the machinery.

We recognize with much pleasure that the preservation of our surplus fruits and berries in marketable shape can be readily and cheaply effected; and that orchard planting and cultivation has consequently received an impetus and encouragement that nothing else could have given them. The actual waste, by abandonment to decay, of excellent fruit, has been enormous among us. It was doubtless pleasant for the horticulturist or pomologist to know that the produce of his vines or trees could be safely pronounced very superior; but it was none the less wearisome and unprofitable to discover that no market existed to reward his labor. The market for our preserved fruits, owing to their superior quality and flavor, is unlimited, and we are no longer precluded by geographical position from developing a valuable resource. It gives us pleasure also to briefly mention that a large number of semi-tropical fruits, the most important of which are almonds, walnuts, oranges, lemons, figs, and olives, are finding extensive cultivation in many localities, north as well as south of San Francisco, and that a uniform success has attended their culture.

OUR RECENT FAIR.

The display of thoroughbred and graded stock of every kind at our Fair, in September last, was a surprising one, even to breeders and dealers. Taken altogether, it was probably as fine and as interesting an exhibition of blooded animals and their kindred, as ever was made in the United States; and it was gratifying to observe that California breeders were not surpassed, in any respect, by Eastern competitors. The value of the stock shown can readily be perceived from an examination of the entries made and premiums awarded; but such perusal cannot convey a proper idea of the beauty of the display. Those alone who were fortunate enough to witness the daily parade of magnificent animals, can appreciate the justifiable enthusiasm of exhibitors and visitors. Horses, mares, and families, of proved origin and established lineage, and showing such strength, spirit, grace, and speed, that no proof of transmitted qualities could be required; bulls, cows, and calves, of high descent, and so perfect in their symmetrical development that the most critical judge could find nothing to disparage; jacks, jennets, sheep, Angora goats, swine, and poultry, of pure blood and great value, and graded stock of every description, thronged the commodious grounds at the Park—visible and gratifying evidences of the adaptability of our extensive pastures to the most valuable purposes, and of the faith in our future that inspires those who control them.

The significance of such a gathering of bands, herds, and flocks, is too plain to be misunderstood. We have a country peculiarly well fitted for

all stock purposes, and are proving the fact with commendable diligence. The time is not far distant when better methods of conducting dairy farms will be understood and followed, and when we can safely challenge the world to surpass—perhaps to equal—California, in any branch of stock raising. If it shall justly lay within our power to issue the like challenge respecting well appointed dairy farms, our State will be vastly the gainer; if not, the fault will lie with the men and not in the country they inhabit. Too little attention has been given to genuine dairying, and a change of policy in the matter is much needed and hoped for.

At the Pavilion, a large number of exhibitors made profuse and meritorious displays of home manufactures and imported goods. Although the department for agricultural machinery and implements had been removed to the Park, thus affording much more room than usual, the halls were all occupied, and the necessary economizing of space created a sense of discomfort. Owing to the yearly increasing interest shown in our Fairs, it seems almost impossible to provide ample room for exhibitors and the public; renewed efforts to accomplish this will be made at the ensuing Fair, and we hope to succeed in fully accommodating guests as well as participants.

We invite attention to our record of the creditable displays made. Considered as the exponents of our progress in almost every department of domestic industry, enterprise, and invention, the articles entered by competitors in such large variety are not only interesting and instructive, but serve also to emphasize the value of the conveniences and labors of the society.

AGRICULTURAL IMPLEMENTS.

It is due to both our importers and local manufacturers to mention, that the department for agricultural implements and labor-saving machinery, established at the Fair grounds in September last, was meritorious in the highest degree, and contained an aggregation of the necessities and conveniences for farming that would have done credit to any State or country.

Superior in make, elegant in finish, excellent in construction, and of the best approved patterns, they easily withstood every applied test, and were generally pronounced to be completely adapted to their respective purposes, and reasonable in prices.

MANUFACTURES.

With all her great natural wealth and resources, and notwithstanding her commercial advantages, mineral deposits, and agricultural blessings, California never will attain to the possible full measure of genuine prosperity until there shall be established and in continuous operation a variety and a large number of factories that will enable her own citizens to reap the benefit that comes from transforming raw material into merchantable shapes.

It has not escaped attention that our soil and climate render prolific, not our mother earth and the lower Darwinian grades alone, but humanity as well; that from Modoc to San Diego, there is a rapidly rising generation of men and women; and that we are bound by the highest

sense of duty to provide employments and occupations, lest prisons and asylums be overcrowded.

Of course our children are, for the most part, fitted by nature and inheritance for the learned professions and for lecture fields—possibly for editors, even—but, there being a danger of crowded ranks, it is earnestly to be hoped that within a few years we may be able to offer good living wages for physical work to young men and women, poets and literati, who constitute a large class that sheep-herding alone does not afford a sufficient refuge when bread has become scarce. Within the last twelve months, our population has been increased by immigration about forty-seven thousand, and it must gratify those who sympathize with the poor, and are compassionate toward laborers and children, to know that only eight thousand of the new arrivals came from China. Natural increase of population is unavoidable; immigration will certainly continue; both are desirable. But we must cease to pay unnecessary tribute to strange countries, if we would wisely avoid the creating of strictly ornamental classes, paupers, and criminals. Our social system has added the word "hoodlum" to the English language, and has established a class that needs regenerating. We owe it to ourselves and to the human race, to show that, as a community, we are capable of a nobler inspiration than that which comes from Washington Irving's sarcastic "almighty dollar." Sound policy and sympathy for the nearly helpless, alike demand concerted action.

Our woolen mills, sugar factories, watch-making establishment, linen factory, and creditable number of other industries, are good as far as they go; but they stop short of our needs, far short of the increase demanded by our situation, and fully warranted by every circumstance of country and population.

We can make no better use of wealth than to keep the greater portion of it at home, but in active use; nor can we attract desirable immigration by any surer method.

Those alone who are oppressed and misgoverned, or who inhabit sterile countries and poverty-stricken lands, may be justified in forcing their children to go abroad in the world to seek for life or meet with death. We have a government under our own control; a fertile and generous home; a range of natural blessings almost peerless in the universe. Let us temper the spirit of our boasting by a spirit of faith resulting in works that show a confidence in our future.

ARBORICULTURE.

Farmers should plant forest trees, and look well to making them thrive and grow.

Through the improvident waste which characterized our earlier history, and in the legitimate use for mining purposes of large quantities of timber, our agricultural interests have suffered great injury, and are now constantly jeopardized from the same causes.

It is notoriously true that throughout the entire mining area valuable timber is constantly, recklessly, and indefensibly wasted. If our miners, and many farmers, as well, were compelled to follow that Japanese law which requires every man who fells a tree to plant a sapling, most of them would not find time for any other work. The spirit of the United States statutes seems incapable of materialization in defense of splendid forests. To procure a few cords of stove-wood, or the furnishing of a

charcoal pit, a person will fell tree after tree of noble proportions, will select for use a few of the choice limbs and branches, and will leave the trunks to decay. The like process will be resorted to if a few shakes are needed to roof in a cabin that may be deserted a month or two later. If this were a desultory practice, or obtained locally only, it would be less a cause for apprehensive reflection; but it is the rule throughout the entire State, and has been supplemented in these later years by a practice scarcely less reprehensible—that of mercilessly cutting down young pines, firs, and cedars—a most wanton system of extravagant waste and improvident destruction. The loss of valuable timber, great as it is, is trifling when compared with the danger that menaces us from the shrinkage in rainfall which must eventually result from such an immense curtailment of forest areas. Centuries of experience and observation in long-settled countries have indisputably established that moisture and fertility disappear with forests; that if broad shafts of sunlight are belted into cleared and devastated uplands, a fatal dryness will characterize the dependent lowlands; that falling forests may ruin distant meadows; that if trees be shorn from the face of the land there will be little grain to reap in after years.

We cannot, therefore, too strongly urge that forest culture should constitute a feature in the operations of every agriculturist in this State. Not alone because in view of the danger threatened the planting of trees is plainly a duty of good citizenship; but for the reasons, too, that it would prove profitable in the immediate future, and would add to our great resources one of almost inestimable value.

We believe that if the subject should receive proper consideration, the practice of planting forest trees would become very general; and that to the favorite eucalyptus would be added many valuable varieties.

DRAINAGE AND IRRIGATION.

The recent disaster at Marysville, apprehension at Sacramento, and devastating inundation of a large area of country supposed to be safe by reason of ditches, embankments, floodgates, and other costly works of reclamation, present the drainage question in such a shape that not merely one section of our community, but the people of the entire State, and the General Government as well, must give it more than a passing notice. The immediate neighborhood, because the law of self-preservation compels it; the people of the entire State, because the problem is one of grave interest to them collectively; and the General Government, because it is of such magnitude, and touches so closely both inland and ocean commerce. Our situation is very peculiar; neither precedent nor parallel for it exists in history. Extensive rivers have for the most part the common features of: sources remote from the sea; various tributary streams; constant disintegrating power and action, enriching or ruining low lands with sedimentary deposits, and equalizing the flow of their own waters—slow in broad channels, rapid through deep gorges—in such a manner that the beds of streams are, as a rule, kept serviceable to the exact necessary degree. In regions where the alternate cloudless and rainy seasons are similar to those of California, the rule is constant, that waters are loaded by freshets with earthy matters. The Mississippi, the Amazon, the Ganges, and the Brahmapootra, and the Nile, as well as the Sacramento, and rivers of its class, periodically sweep to the sea great volumes of accumulated waters surcharged with

detritus. If we had this process in nature alone to contend against, the Sacramento, enriched by the Feather and American Rivers, could be trusted to keep the ancient tenor of its way, and preserve a commodious channel; and the latter streams would seldom escape from their banks. But these rivers have been ruined by mining operations. The great auriferous area drained into the Sacramento contains scarcely a stream, natural outlet or escapeway, that has not been filled up nearly flush with its banks through all the level places with tailings from mining claims; and deposits of the same material, of astonishing depth, characterize them all within their mountain environs. We have no system of drainage left, either natural or artificial, that is at all proportionate to the large watershed. No system of levees, no works of reclamation can be fairly effected, to withstand the force of waters practically driven from natural wasteways.

It may be suggested, for the purpose of showing the serious condition of affairs, and without any intention to start a discussion that might become a bitter one and fail to effect much good—work being needed more than argument—that the continuous pouring of earth into our streams by miners, whose operations are necessarily of a temporary character, is causing the constant ruin of large bodies of agricultural land that would else be valuable for ages to come; and that therefore a sound political economy, valuing the permanent above the transient, demands the protection of the latter at the expense of the former. Deep gravel mining is said to have been scarcely begun in this State. There seems no escape from the conclusion, that, in addition to ruin already accomplished by tailings, farming and pasture lands that could be otherwise converted into permanent homes, valuable to their owners and to the commonwealth for all time to come, must remain abandoned in order that miners may pursue their always temporary and often merely experimental enterprises. We repeat, that this phase of a great problem is here presented as a fact only—not for the purpose of arguing from. Our desire is to attract discussion and elaborate consideration of the situation, rather than to indulge in it.

San Pablo Bay is necessarily shoaling with great rapidity; that of San Francisco is receiving vast deposits. The drainage of the greater portion of California, already nearly ruined by causes alluded to, is now seriously checked at tide-water, and the whole subject is worthy to be gravely examined by the General Government, and treated with the best engineering skill that can be invoked.

The problem of irrigation is of like magnitude. An able address on the subject was delivered before our society, last September, by Hon. Morris M. Estee. It will be found in our report of transactions, and is worthy of thoughtful attention. The subject has now been widely discussed by competent engineers; has been debated in our Legislature; has attracted the notice of capitalists, the daily press, the State authorities, and the General Government. It yet remains true that nothing on a large scale has been accomplished. The superabundant rains of Winter create destroying floods and escape to the ocean, while the pitiless Summer heat remains untempered in our inland valleys, because the water has run to waste. This is owing, in a great degree, to the magnitude of the question, and the difficulties which beset its solution. It would be inappropriate to discuss it at length in this connection, but we desire to suggest that it ought to receive energetic notice, and, if possible, an unusual degree of attention from every member of this society, and from every citizen having the true interests of the State at heart.

CONCLUSION.

In conclusion, we would respectfully suggest for consideration by the Legislature, that the methods of collecting and preparing statistical information in this State always have been and yet remain quite defective; that the State Agricultural Society should have the duty of such collection and preparation imposed on it by law; and that means to effectually perform the work should be supplied by the State.

R. S. CAREY, President.

ROBERT BECK, Secretary.

FINANCIAL REPORT

OF THE

STATE AGRICULTURAL SOCIETY

FOR

THE YEAR 1874.

Date.	On what account.	Amount.
	RECEIPTS.	
1874.		
Jan. 14.....	Amount received for memberships at meeting...	$415 00
"	H. E. McCuen, life membership.....	50 00
"	Repairing Secretary's office, Pavilion.....	150 00
Feb. 7.....	J. Moody, seats in new stand at last Fair.....	6 00
Feb. 12.....	A. A. Wood, account of rent of Park.....	200 00
March 7....	A. A. Wood, account of rent of Park.....	200 00
April —....	A. A. Wood, account of rent of Park.....	200 00
May 18.....	A. A. Wood (D. O. Mills & Co.), rent of Park ...	470 00
"	Received for thirty copies of Running Rules.....	7 50
"	Received of Thos. McConnell, life membership...	45 00
July 22.....	Received of A. A. Wood, for rent of Park.....	544 00
August 1...	Received for six copies of Racing Rules.....	1 50
	The following amounts were contributed toward the removal of the wall at the Park:	
August 1...	George W. Chesley.....	20 00
"	E. M. Skaggs.....	20 00
"	W. P. Coleman.....	20 00
"	H. M. Bernard.....	20 00
"	Fred. Cox.....	20 00
"	R. Hamilton.....	20 00
"	W. F. Swimley.....	20 00
"	C. Traver.....	20 00
"	L. L. Baker.....	20 00
"	J. M. Keller.....	20 00
"	Jerome C. Davis.....	20 00
"	Robert Beck.....	20 00

Date.	On what account.	Amount.
August 1...	Dr. Montgomery	$20 00
"	John Bellmer	10 00
"	James McGuire	10 00
"	Whyte & Nicholl	10 00
"	Drury Melone	20 00
"	C. H. Ross	20 00
"	Reel & Barber	5 00
"	C. H. Swift	10 00
"	E. R. Hamilton	5 00
"	Adams, McNeil & Co	10 00
"	J. P. Lowell	5 00
"	Mooney	10 00
"	Shepard	2 50
"	Joseph M. Gribble	5 00
"	T. D. Scriver	5 00
"	Whittier, Fuller & Co	20 00
"	F. W. Fratt	20 00
"	Wilson & Mason	10 00
"	J. L. Eoff	5 00
"	Friend & Terry	10 00
"	H. C. Johnson	5 00
"	David S. Taylor	5 00
"	Thomas Harper	5 00
"	H. C. Kirk	10 00
"	D. H. Quinn	2 50
"	Cash	2 00
"	Nelson & Mason	5 00
"	Coburn	2 50
"	Gottleib	2 50
"	Morse & Co	2 50
"	F. X. Ebner	10 00
"	Phil. Callahan	10 00
"	Cash	2 00
"	Cash	3 00
"	R. T. Brown	10 00
"	William Kneedhat	10 00
"	Grant H. Springer	10 00
"	Parker & Perry	5 00
"	L. B. Moon	5 00
"	J. E Mooney	5 00
"	E. E. Ames	10 00
"	John Ryan	5 00
"	L E. Crane	2 50
"	N. L. Drew & Co	40 00
"	C. H. Green	10 00
"	Chris. Green	20 00
"	C. Trainor	10 00
"	J. Wetzlar	20 00
"	D. C. Patten	5 00
"	General A. Redington	20 00

Date.	On what account.	Amount.
August 1...	Smith & Williams	$20 00
"	Booth & Co.	40 00
"	W. F. Knox	10 00
"	Horace Adams	5 00
"	R. C. Woolworth	5 00
"	Schreiber & Howell	10 00
"	J. B. Simmes	5 00
"	Thomas Atchison	10 00
"	C. W. Clark	20 00
"	A. A. Woods	20 00
"	Edgar Mills	20 00
"	Albert Gallatin	20 00
"	Charles Coyle	10 00
"	William Hawkins	10 00
"	Mike Bryte	20 00
"	Mike E. White	2 50
"	Grand Hotel (By Poorman & Chandler)	40 00
"	John Farren	1 00
"	William Young	2 50
"	F. F. Dolan	2 50
"	Gus. Gotthold	5 00
"	Cash	1 00
"	Morris Haley	2 00
"	Gruhler & Brothers	10 00
"	Joseph Hill	5 00
"	Bronner & Deninger	2 50
"	Laufkotter Brothers	5 00
"	John Luebbering	5 00
"	A. Lehman	2 50
"	George Rowland	10 00
"	E. Jacobs	3 00
"	Sweetser & Alsip	10 00
"	J. R. Brown	5 00
"	James Carolan	20 00
"	William Hamilton	20 00
"	C. L. Newton	10 00
"	A. S. Hopkins	5 00
"	G. S. Wait	5 00
"	Mr. Frazier	5 00
"	Locke & Lavenson	10 00
"	Lipman & Co.	20 00
"	P. Gruhler	10 00
"	G. H. Swinerton	5 00
"	Cash	2 00
"	George Lorenz	10 00
"	M. R. Rose	2 00
"	E Green	2 50
"	E. L. Billings	5 00

Date.	On what account.	Amount.
August 1...	D. M. McMullen	$10 00
"	J. Rock..	5 00
"	Bernardi & Selna	2 00
"	J. A. Duffy	5 00
"	A. S. Crable	10 00
"	P. H. Russell	10 00
"	John Batcher	2 50
"	Klebitz & Green	5 00
"	George W. Wick	2 50
"	L. Kellogg	1 00
"	L. A. Upson	2 50
"	Gleeson & Fell	2 50
"	R. C. Clark	20 00
"	E. A. Burr	5 00
"	J. B. Frost	5 00
"	Lee Stanley	5 00
"	Gerber & Lorenz	5 00
"	W. C. Hopping	10 00
"	J. J. Green	20 00
"	J. T. Stoll	5 00
"	Horatio Hurd	5 00
"	Mohr & York	5 00
"	F. S. George	2 50
"	H. M. Larue	10 00
"	F. R. Dray	10 00
"	B. A. Farr	5 00
"	H. Eldred	5 00
"	J. H. Groth	5 00
"	Jones, Givens & Co	5 00
"	J. J. Bauer	5 00
"	H. O. Seymour	5 00
"	Daniel Brown	5 00
"	H. C. Harrison	5 00
"	E. H. Miller	20 00
"	E. M. Fry	20 00
"	William Bassett	10 00
"	J. H. Miller	2 50
"	J. C. Roley	10 00
"	T. B. McFarland	5 00
"	Chris. Weisel	10 00
"	Joseph Davis	5 00
"	Creed Haymond	5 00
"	Fox & Strutz	10 00
"	James Hanlon	5 00
"	D. Cooper	10 00
"	Bever & Townsend	10 00
"	Thomas Guinean	10 00
"	Gerber Brothers	5 00
"	H. S. Crocker & Co	20 00
"	Ed. Cadwalader	5 00

Date.	On what account.	Amount.
August 1...	Frank Rudel	$5 00
"	James J. Agard	2 50
"	John N. Andrews	5 00
"	P. L. Hickman	5 00
"	J. P. Larue	5 00
"	D. W. Earl	20 00
"	S. H. Harris	2 50
"	J. A. Stewart	5 00
"	Samuel Redington	5 00
"	R. C. Terry	10 00
"	Robert Gardner	20 00
"	Van Heusen & Huntoon	5 00
"	M. Toomey	5 00
"	H. Wachhorst	5 00
"	Robert Allen	5 00
"	James Du Boise	10 00
Sept. 1.....	Richard Woods, brick from west wall	100 00
Sept. 5.....	A. A. Woods, account of rent of Park	400 00
Sept. 19.....	A. A. Woods, account of rent of Park	500 00
"	Charles McLaughlin, life membership	50 00
"	James H. Miller, life membership	50 00
"	Killip & Co., pool privilege	3,000 00
Sept. 21.....	Memberships sold at the Pavilion previous to 10 A. M.	780 00
"	A. A. Woods, account of rent of Park	1,000 00
"	F. Cox, rent of sale stands	112 00
"	F. Cox, old lumber	38 70
"	A. S. Greenlaw, account, cider privilege	71 50
"	A. L. Eoff, back entrance money	20 00
"	Commissions on sales of stock, donated by Killip & Co	67 45
"	Fred. Cox, sale receipts	5 75
"	A. Menke, life membership	40 00
"	P. T. Williamson, life membership	45 00
"	Geo. Cadwalader, life membership	45 00
"	Adin Bullard, life membership	50 00
"	L. L. Lynch, bar privilege	130 00
"	Restaurant privilege at Pavilion	175 25
"	Ticket receipts at Park	2,372 75
"	Ticket receipts at Pavilion	1,891 05
"	Entries to purse No. 1	400 00
Sept. 22.....	Ticket receipts at Park	3,106 95
"	Ticket receipts at Pavilion	1,020 50
"	Entries to purse No. 2	375 00
Sept. 23.....	Ticket receipts at Park	2,365 80
"	Ticket receipts at Pavilion	847 00
"	Entries to purse No. 3	400 00
"	Entries to purse No. 5—No. 4 did not fill	300 00
"	Entries to purse No. 6	400 00
"	Entries to purse No. 7	225 00

Date.	On what account.	Amount.
Sept. 23.....	Entries to special purse.....	$350 00
Sept. 24.....	Ticket receipts at Park.	2,252 40
"	Ticket receipts at Pavilion.....	893 55
"	Entries to purse No. 9.....	600 00
"	Entries to purse No. 11.....	375 00
Sept. 25.....	Ticket receipts at Park.....	4,425 85
"	Ticket receipts at Pavilion.....	637 00
"	Entries to purse No. 12.....	400 00
"	Entries to purse No. 13.....	300 00
"	Entries to special purse.....	1,500 00
Sept. 26.....	Ticket receipts at Park.....	1,514 35
"	Ticket receipts at Pavilion.....	318 50
"	Entries to purse No. 14.....	600 00
"	Entries to purse No. 15.....	525 00
Sept. 28.....	Ticket receipts at Park.....	229 00
"	Ticket receipts at Pavilion.....	52 50
"	Fine, purse No. —	10 00
"	Rufus Lowell, entrance to regatta.....	64 00
"	M. D. Boruck, seats at Park, new stand.....	110 00
"	F. Foster, life membership.....	50 00
"	A. K. P. Harmon, life membership.....	50 00
"	H. G. Williams, subscription to move west wall..	10 00
"	Bush Bros.. subscription to move west wall.....	10 50
"	Six copies Running Rules.....	1 50
"	R. E. Gogings, subscription to move west wall...	2 50
"	Memberships sold by E. B. Ryan (eighty-six)....	430 00
"	Entrance to sweepstakes at Park.....	285 00
"	State appropriation warrant sold for.....	14,600 00
"	M. D. Boruck, seats new stand sold at Pavilion..	40 00
Oct. 19.....	Fred. Cox, sale of pens at Park.....	43 00
Oct. 21.....	A. Ross, life membership.....	45 00
"	J. J. Felter, subscripton to move west wall.....	5 00
"	Board of Supervisors, building stairs.....	500 00
Oct. 26.....	H. W. Schacht, life membership.....	50 00
"	E. Mills, subscription to move west wall.....	20 00
"	S. Redington, subscription to move west wall....	5 00
"	R. C. Terry, subscription to move west wall.....	10 00
"	H. Wachhorst, subscription to move west wall..	5 00
"	R. E. Gogings, subscription to move west wall...	2 50
"	Bush Bros., subscription to move west wall.....	10 00
"	R. C. Cravens, subscription to move west wall...	5 00
"	Phil. Scheld, subscription to move west wall.....	10 00
Nov. 12.....	A. A. Woods, account of rent of Park.....	400 00
Dec. 5.....	Daniel Flint, subscription to move west wall.....	10 00
"	*Wilkes' Spirit of the Times*, returned subscription for volume two, Stud Book.....	9 00
Dec. 9.....	Drury Melone, loan.....	10,000 00
Dec. 10.....	Sacramento Hussars, rent of Armory, November and December.....	10 00
"	Sacramento Zouaves, rent of Armory, on account.	5 00

Date.	On what account.	Amount.
Dec. 10.....	Sacramento Zouaves, rent of Armory, on account.	$5 00
"	Emmet Guard, rent of Armory.....	10 00
Dec. 29.....	A. A. Woods, account of rent of Park.....	500 00
1875.		
Jan. 16.....	City Guard, rent of Armory, November and December.....	10 00
"	Sarsfield Guard, rent of Armory.....	10 00
	Total.....	$66,651 85

EXPENDITURES.

1874.		
Jan. 13.....	By amount overdrawn on Treasurer in 1873.....	$49 47
Jan. 17.....	Anton Menke, paper basket.....	4 00
Jan. 21.....	Taxes on lots bought of Gardner & Coleman.....	8 55
"	Mrs. A. N. Stevenson, premium.....	5 00
Jan. 24.....	Sacramento *Bee*, advertising.....	3 50
Jan. 25.....	M. Hanrahan, wood.....	10 00
Jan. 27.....	C. Zimmermacher, setting trees at Park.....	32 50
Jan. 29.....	Robert Beck, salary for January, 1874.....	166 66
"	Expenses, per bill filed.....	9 50
"	Lumber for boxing trees.....	41 60
Jan. 31.....	J. M. Boardman, office signs.....	7 00
Feb. 7.....	Thomas Hammond, boxing trees at Park.....	31 50
Feb. 10.....	George W. Mayberry, boxing and trimming trees at Park.....	101 50
Feb. 11.....	James Parsons, premium, 1873.....	3 00
Feb. 12.....	E. L. Brooks, premium, 1873.....	15 00
"	Keller, Hines, Thomas & Co., premium, 1873.....	10 00
Feb. 14.....	W. C. Alford, balance for setting trees, etc.....	86 10
Feb. 16.....	R. Alford, labor at Park.....	37 50
"	I. Eberhart, premium, 1872.....	20 00
Feb. 24.....	Dewey & Co., plate Alfileria.....	7 50
"	Express charges.....	50
"	F. S. George, interest on lots on F and H, Twenty-second and Twenty-third streets.....	93 75
"	G. G. W. Morgan, filling diplomas, 1872.....	3 75
Feb. 27.....	Stedman, Brower & Lyons, Gray's Atlas of the United States.....	20 00
Feb. 28.....	Robert Beck, salary for February, 1874.....	166 66
"	Postage stamps.....	2 00
"	Filling diplomas.....	1 50
"	California Directory.....	1 00
"	Porter cleaning office.....	5 00
"	Delivering diplomas.....	1 00
"	Postage stamps.....	2 50
"	Delivering diplomas.....	1 00
"	Brooms.....	75

Date.	On what account.	Amount.
Feb. 28.....	Porter, care office.....	$5 00
"	Postage stamps.....	2 50
"	Matches.....	50
"	Ryan & Miller's bill.....	3 00
"	Robert Beck, salary for March.....	166 66
March 4....	Hunt & Anderson, lumber bill.....	217 66
March 6....	C. Zimmermacher, labor at Park.....	23 75
March 12..	A. Miess, plowing and labor at Park.....	50 00
March 21..	A. Miess, plowing and labor at Park.....	25 00
March 24..	Robert Williamson, shade trees.....	175 50
May 18.....	Post office bill.....	8 00
"	Stamps, currency, ten dollars.....	9 00
"	W. C. Alford, labor.....	4 37
"	Powers & Henderson's bill.....	7 50
"	Hauling reports to office.....	75
"	Cleaning office, one month.....	5 00
"	Filling diploma.....	75
"	One dozen pencils.....	50
"	Cleaning office.....	5 00
"	Robert Beck, salary for April.....	166 66
"	M. Hanrahan, for wood.....	9 00
May 20....	H. Wachhorst, silverware.....	22 50
June 3.....	D. B. Stewart, labor on new stand.....	15 00
June 5.	Barnes & Barber's bill.....	9 20
June 6.....	C. Zimmermacher, labor on new stand.....	25 00
"	W. Slater, labor on new stand.....	32 50
"	S. H. Davis' bill.....	25 00
June 8.....	F. Mahull, labor on new stand.....	16 50
June 10.....	D. H. Woods, premium.....	40 00
June 11.....	Robert Beck, salary for May.....	166 66
"	L. F. Allen, thirteen volumes American Herd Book.....	9 70
"	George Wilkes' Stud Book and Trotting Register.	27 22
June 12.....	Whittier, Fuller & Co., diploma frames.....	6 75
June 13.....	H. Johnson, moving stand.....	100 00
"	P. M. Chatterton, new stand.....	50 00
"	James McGraw, new stand.....	30 00
"	John Hollihan, new stand.....	25 00
"	W. Landerkin, new stand.....	30 00
"	F. M. Marshall, new stand.....	40 00
"	M. Fielder.....	30 00
"	H. Kelley.....	18 00
"	Jos. Connell.....	30 00
"	Charles Ott.....	20 00
"	N. Hathaway.....	45 00
"	James Voorhies.....	45 00
"	Austin Cook.....	20 00
"	W. Slater, account new stand.....	30 00
"	J. W. Neff, new stand.....	30 00
"	R. Butterfield, new stand.....	30 00

Date.	On what account.	Amount.
June 13.....	John Liness, new stand.....	$40 00
"	R. C. Gilchrist, new stand.....	13 75
"	James Touhey, new stand.....	18 75
"	—— Preston, new stand.....	18 75
"	W. C. Alford.....	30 00
June 17.....	D. F. Longstreet.....	67 87
"	John Liness, new stand.....	24 00
June 27.....	H. C. Johnson, moving stand.....	100 00
"	Hamburger & Co., two boxes.....	1 00
"	Hauling reports to Wells, Fargo & Co.....	75
"	Post Office orders.....	75
"	Hauling reports to Wells, Fargo & Co.....	1 00
"	Filling diploma.....	75
"	Post Office stamps.....	9 05
"	Trotting Rules and express charges.....	8 50
"	Joseph Cafrich, work on new stand.....	1 50
"	James Felter, work on new stand.....	2 50
"	Cleaning office.....	5 00
June 30.....	James McGraw, work on new stand.....	25 00
July 3.....	Robert Beck, salary for June.....	166 66
"	H. Kelly, work on new stand.....	21 75
"	F. M. Marshall.....	55 00
"	William Landerkin.....	40 00
"	Charles Ott.....	15 00
"	Austin Cook.....	37 50
"	John Hollihan.....	26 25
"	J. H. Cooper.....	10 00
"	William Slater.....	40 00
"	W. A. Sharon.....	30 00
"	F. Fiedler.....	30 00
"	J. W. Neff.....	10 00
"	L. Preston.....	20 00
"	P. M. Chatterton.....	50 00
"	G. W. Mayberry.....	40 00
"	N. Hathaway.....	45 00
"	James Voorhies.....	45 00
"	James Touhey, work on new stand.....	25 00
"	W. F. Traxell, work on new stand.....	15 00
"	W. F. Traxell, work on new stand.....	8 94
"	James Voorhies, work on new stand.....	78 00
"	P. M. Chatterton, work on new stand.....	20 00
"	N. Hathaway, work on new stand.....	25 00
"	Charles Geston, work on new stand.....	15 00
"	Cox & Co., nails for new stand.....	8 50
"	Laufkotter Brothers' bill.....	1 50
"	P. M. Chatterton, labor on new stand.....	37 56
July 8.....	Miss M. A. Picard, premium.....	10 00
July 13.....	Central Pacific Railroad Company, dressing and trimming timbers for new stand.....	505 50

Date.	On what account.	Amount.
July 27.....	Express charges on Stud Book and Trotting Regulations	$2 65
"	Post Office stamps	9 05
"	Express charges on membership Turf Congress..	1 50
"	*Daily Record*, advertising..	7 50
"	John Perry, hauling pipe to Park	3 00
"	Thomas McConnell, premium, 1871	20 00
July 29.....	King & Morse, shingling for new stand	78 77
"	Central Pacific Railroad Company, dressing lumber for new stand	20 00
July 31.....	Conrad & Hews, shingling new stand	52 32
August 1...	Charles Sexton, shingling new stand	133 76
"	W. Landerkin, work on new stand	30 00
"	R. Butterfield, work on new stand	12 00
"	W. A. Sharon, work on new stand.	20 00
"	Austin Cook, work on new stand	40 00
"	M. Fiedler, work on new stand	30 00
"	F. M. Marshall, work on new stand	20 00
"	E. S. Teder, work on new stand	25 00
"	James Touhey, work on new stand	40 00
"	J. W. Neff, work on new stand	20 00
"	William Slater, work on new stand	20 00
"	N. Hathaway, work on new stand	15 00
"	L. Preston (by Chatterton), work on new stand.	10 00
"	James Voorhies, work on new stand	20 00
"	N. R. Hathaway, work on new stand	20 00
"	F. M. Marshall, work on new stand	30 00
"	M. Fiedler, work on new stand	31 00
"	William Slater, work on new stand	20 00
"	L. Tomlin, work on new stand	12 00
"	William Landerkin, work on new stand	20 00
"	William Sharon, work on new stand	10 00
"	P. M. Chatterton, work on new stand	20 00
"	Austin Cook, work on new stand	21 87
"	P. M. Chatterton, work on new stand	18 13
August 29..	Gas bill	3 75
"	Post Office bill	4 00
"	Express charges on ornaments for roof at Park.	30
"	Post Office stamps, $10, currency	9 20
"	Newspapers	1 00
"	Express charges on posters to San Francisco	50
"	Sacramento *Record*, advertising, etc	11 25
"	Robert Beck, salary for July, 1874	166 66
"	R. C. Gilchrist, balance paid hands on new stand.	12 50
"	W. C. Alford, for labor	10 00
"	G. W. Mayberry, for labor	100 00
"	J. D. King	5 70
"	H. Whitaker, whitewashing	100 00
"	James Touhey and — Alford, shingling stand	20 82
"	Philip Flynn, order	15 00

Date.	On what account.	Amount.
August 29..	H. C. Johnson, moving Judges' stand	$38 00
"	S. Briggs, labor	15 00
"	P. M. Chatterton, new stand	10 00
"	J. W. Neff, new stand	35 00
"	Chs. Ott, new stand	15 00
"	William Landerkin, new stand	10 00
"	James Voorhies, new stand	10 00
"	N. Hathaway, new stand	10 00
August 31..	Robt. Beck, salary, August, 1874	166 66
"	L. Preston, labor at Park	34 37
Sept. 1.....	E. T. Yondus, carpenter, new stand	1 17
Sept. 3.....	Wm. Sharon, carpenter, new stand	62 00
"	N. Hathaway, labor on new stand, etc	50 00
"	Samuel Anderson, at Park	15 00
"	Thomas McNeil, at Park	5 00
"	Amos Turner	21 25
Sept. 7.....	William Prather, labor at Pavilion	27 50
Sept. 11....	Chas. Ruland, carpenter at Park	20 00
"	Jas. Voorhees, carpenter new stand	132 00
Sept. 12....	J. R. Webber, carpenter at Park	32 00
"	*Spirit of the Times*	50
"	Car decomposed granite	16 00
Sept. 15....	R. Butterfield, new stand	98 00
"	Geo. W. Mayberry, new stand	160 00
"	P. M. Chatterton, new stand	175 00
"	C. Ott, new stand	200 00
"	Wm. Landerkin, new stand, balance	135 50
Sept. 17....	W. L. Herndon, brick work, new stand	63 25
"	A. Meiss, at Park	50 00
Sept. 21....	Monroe Haight, labor at Park	7 50
"	C. Mitchell, cleaning stables	2 00
"	Wm. Ellis, labor at Park	5 00
"	Two loads dirt for Pavilion	2 50
"	Hauling books to Park	75
"	James Cornell, new stand	50 00
"	W. T. Cornell, new stand	46 00
"	Envelopes, Wells, Fargo & Co	1 00
"	Telegram	50
"	*Spirit of the Times*, advertising	130 00
"	W. C. Alford, new stand	20 00
"	John McLaughlin	32 50
"	Car tickets	25
"	C. H. Krebs, painting new stand	200 00
"	Bullard, whitewashing at Park	30 00
"	John Galvin, hauling dirt for Pavilion	5 00
"	L. Graves, whitewashing at Park	31 25
"	Purses to races during the Fair	2,450 00
Sept. 22....	Purses to races during the Fair	2,000 00

Date.	On what account.	Amount.
Sept. 23.....	Purses to races during the Fair.....	$1,250 00
Sept. 24.. ..	Purses to races during the Fair.....	1,750 00
Sept. 25.....	Purses to races during the Fair.....	1,750 00
"	Purses to races during the Fair.....	5,000 00
Sept. 26.....	Purses to races during the Fair.....	1,750 00
"	Purses to races during the Fair.....	380 00
"	M. W. Willis, for music.....	575 00
Sept. 28.....	W. S. Manlove (1873), premium.....	5 00
"	S. B. Emerson, premium.....	195 00
"	Charles Clark, premium.....	30 00
"	William Boots, premium.....	70 00
"	William Hamilton, premium.....	300 00
"	W. A. Finley, premium.....	1 00
"	Chris. Thodt, premium.....	55 00
"	A. Newbauer, premium.....	20 00
"	John Hall, premium.....	155 00
"	R. S. Thompson, premium.....	105 00
"	N. Gilmore, premium.....	150 00
"	L. Pierce, premium.....	80 00
"	L. Comstock, premium.....	92 50
"	Jesse Sutton, premium.....	6 00
"	Jones & Co., premium.....	115 00
"	J. T. Bailey, premium	15 00
"	C. Younger, premium.....	190 00
"	W. B. Gibson, premium.....	25 00
"	McCarty & Lapham, premium.....	30 00
"	Severance & Peet, premium.....	250 00
"	William Blacow, premium.....	175 00
"	John Munson, premium.....	30 00
"	E. Sparks, premium.....	30 00
"	Jesse D. Carr, premium.....	60 00
"	J. P. Sargent, premium.....	55 00
"	E. S. Eaton, premium.....	70 00
"	W. F. McCracken, premium.....	20 00
"	George Bemont, premium.....	110 00
"	John C. Boggs, premium.....	50 00
"	M. Wick, premium.....	60 00
"	M. Biggs, premium.....	80 00
"	M. Biggs, premium.....	50 00
"	Charles Green, premium.....	10 00
"	Murray & Watt, premium.....	55 00
"	James McComb, premium.....	30 00
"	James Green, premium.....	25 00
"	E. A. Bridgford, premium.....	65 00
"	William Friel, premium.....	5 00
"	J. Sessions, premium.....	40 00
"	W. P. A. Craig, premium.....	25 00
"	Jeff. Bridgford, premium.....	235 00
"	M. Hopkins, premium.....	15 00
"	Leland Stanford, premium.....	20 00

Date.	On what account.	Amount.
Sept. 28.....	E. H. Miller, premium.....	$20 00
"	John Gosling, premium.....	15 00
"	W. B. Carr, premium.....	40 00
"	E. Price, premium.....	20 00
"	Jesse D. Carr, premium.....	50 00
"	G. W. Hancock, premium.....	30 00
"	J. J. Bell, premium.....	40 00
"	J. C. Mills, premium.....	5 00
"	A. Parker, premium.....	5 00
"	W. D. Fickett, premium.....	3 00
"	P. J. Hopper, premium.....	25 00
"	Mrs. W. E. Woods, premium.....	5 00
"	Nichols & Co., premium.....	50 00
"	S. Treat, premium.....	30 00
"	Capital Woolen Mills, premium.....	105 00
"	T. K. Stewart, premium.....	18 00
"	H. Hellge, premium.....	5 00
"	T. W. Strobridge, premium.....	40 00
"	James Glide, premium.....	25 00
"	Miss A. J. Gerrish, premium.....	10 00
"	Mrs. L. Howe, premium.....	5 00
"	Wm. Hamilton, premium.....	100 00
"	John Berry, premium.....	40 00
"	L. Johnson, premium.....	40 00
"	Mme. Anna Getz Lucas, premium.....	35 00
"	Mrs. Storch, premium.....	3 00
"	Mrs. M. Favero, premium.....	5 00
"	R. A. Brompton, premium.....	90 00
"	H. Hamel.....	17 50
"	Bassett & Miller, premium.....	25 00
"	Joseph Cairn Simpson, premium.....	40 00
"	Robert Cowne, premium.....	20 00
"	Returned E. W. Haine, for extra tickets purchased.....	5 00
"	F. S. George, premium.....	5 00
"	John Neil, premium.....	40 00
"	R. A. Rose, premium.....	5 00
"	L. C. Powers, premium.....	72 50
"	Mrs. Murphy, premium.....	40 00
"	Mrs. Lyon, premium.....	8 00
"	Mrs. J. Seibenthaler, premium.....	5 00
"	Mansfield, Wing & Co., premium.....	5 00
"	Al. Smith, premium.....	50 00
"	C. P. Henley, premium.....	20 00
"	B. N. Bugbey, premium.....	100 00
"	Mrs. C. W. Clark.....	5 00
"	M. Kesler.....	15 00
"	E. F. Aiken.....	13 00
"	Mrs. F. Aiken.....	10 00
"	Miss Kittie Almond.....	3 00

Date.	On what account.	Amount.
Sept. 28.....	Miss M. Donovan	$5 00
"	Miss H. E. Sprague	20 00
"	J. R. Nickeson	120 00
"	Aitken & Luce	145 00
"	C. Gurgis	5 00
"	Mrs. C. S. Hartwell	5 00
"	Miss J. M. Pierce	8 00
"	Mrs. H. Coole	16 00
"	Daniel Mason	15 00
"	A. Menke	40 00
"	P. Fisher	15 00
"	Alexander McKay	10 00
"	John Hening	5 00
"	M. Butler	5 00
"	C. H. Theis	5 00
"	William Kendall	2 00
"	W. Fern	13 00
"	Thomas Edwards	50 00
"	Bergman Brothers	28 00
"	Sacramento Valley Beet Sugar Company	20 00
"	C. W. Hoyt	3 00
"	Madame Cecil Romer	25 00
"	Emerson Johnson, police at Park	20 00
"	James Coffee, police at Park	24 00
"	Reel & Childs, grain at Park	53 35
"	William Holt, ticket clerk at Park	30 00
"	William Holt, watchman at Pavilion	7 50
"	E. A. Burr, hay and grain at Park	131 81
"	John Toomey, hack hire	4 00
"	Robert Anderson, smokestacks at Park	75 00
"	A. Grubbs, hauling chain, etc	10 00
"	Calvyn & Chipman, painting signs at Park	30 00
"	James Comill, labor at Park	188 75
"	M. Sprague, hay at Park	680 00
"	W. C. Alford, labor at Park	150 00
"	M. Fiedler, labor at Park	75 00
"	C. P. R. R. bill	134 53
"	J. Wicker, carpenter work at Park	84 00
"	J. Cooper, carpenter work at Park	313 00
"	M. Toomey, straw at Park	419 74
"	R. Butterfield, carpenter work at Park	200 00
"	C. Sexton, carpenter work at Park	93 00
"	N. R. Hathaway, carpenter work at Park	159 00
"	R. Johnson, work at Park	17 50
"	John Nicholson, police at Park	20 00
"	F. M. Marshall, carpenter work at Park	30 00
"	F. M. Marshall, carpenter work at Park	20 00
"	John Isaacs, police at Park	42 00
"	Diego Morales, police at Park	28 00
"	Pat. Branigan, police at Park	28 00

Date.	On what account.	Amount.
Sept. 28.....	G. F. Lange, police at Park.....	$24 00
"	N. Ray, labor at Park.....	17 50
"	Wm. N. Cheaner, stairs at Park.....	24 00
"	W. H. Allen, stairs at Park.....	24 00
"	L. Preston, work at Park.....	15 00
"	N. J. Toll, work at Park.....	28 00
"	S. W. Perry, work at Park.....	28 00
"	Ed. Hesser, work at Park.....	56 00
"	M. Fiedler, work at Park.....	58 50
"	Isaac Galloway, work at Park.....	15 00
"	Gregory Nation, work at Park.....	9 50
"	W. E. Wise, blacksmith bill at Park.....	13 00
"	W. H. Hatch, carpenter at Park.....	30 00
"	Wm. Slater, carpenter at Park.....	185 00
"	P. M. Chatterton, carpenter at Park.....	15 00
"	C. H. Trumbull, carpenter at Park.....	6 00
"	Jas. Touhey, carpenter at Park.....	85 00
"	Jas. Touhey, carpenter at Park.....	20 00
"	Jas. H. Kent, hay at Park.....	7 50
"	Bill of stakeboats for regatta.....	7 50
"	E. Barnard, gate-keeper at Park.....	9 00
"	Jesse Sutton, watchman at Park.....	6 00
"	T. J. Whalan, at Park.....	24 00
"	T. D. Scriver, hack driver.....	20 00
"	North Wellington, reporters' stand.....	19 00
"	John W. Earl, labor at Park.....	24 00
"	F. F. Johnson, labor at Park.....	38 00
"	Louis Whiting, tending stand at Park.....	40 00
"	J. S. Williams, at Park.....	28 00
"	L. Preston, police at Park.....	28 00
"	H. Toomey, team at Park.....	4 00
"	C. Curtin, police at Park.....	28 00
"	Samuel Deal, police at Park.....	35 00
"	W. H. Todd, police at Park.....	44 00
"	E. B. Carpenter, police at Park.....	24 00
"	J. Johnson, police at Park.....	28 00
"	—— Antonio, police at Park.....	8 00
"	E. Hess, police at Park stairs.....	28 00
"	G. W. White.....	28 00
"	Painter & Co., electrotype of stand.....	46 50
"	John P. Linton, at Pavilion.....	20 00
"	B. H. Coville, carpenter at Pavilion.....	6 00
"	A. Keithly, watchman at Pavilion.....	36 00
"	W. G. English, ticket clerk at Pavilion.....	35 00
"	James Harney, ticket clerk at Pavilion.....	35 00
"	Mrs. Jackson, chambermaid.....	17 50
"	Charles Bonta, ticket clerk at Park.....	30 00
"	Charles Bonta, ticket clerk at Pavilion.....	12 00
"	Restaurant bill for watchmen.....	5 00
"	J. V. Hall, examiner and fireman.....	120 00

Date.	On what account.	Amount.
Sept. 28.....	F. J. Lewis, life membership certificates.....	$4 50
"	Charles Hunt, carpenter at Pavilion.....	22 00
"	Elisha Youdder, carpenter at Pavilion.....	48 00
"	Elisha Youdder, carpenter on Pavilion stairs....	24 00
"	John Voorhees, carpenter on stairs.....	64 00
"	Nelson Wilcox, carpenter at Pavilion.....	82 00
"	Nelson Wilcox, carpenter on Pavilion stairs.....	24 00
"	H. Burnett, carpenter at Pavilion.....	46 00
"	Mrs. McKinner.....	10 00
"	W. A. Ransom, clerk at Pavilion.....	10 00
"	J. E. Stoughtonburg, entry clerk.....	70 00
"	W. H. Payne, attorney for B. Hoyt, entry clerk.	70 00
"	J. T. Griffits, bill for sheeting.....	11 65
"	Baker Stable, bill for keeping sheep.....	12 00
"	S. Lipman & Co., bill.....	2 25
"	George Pardee, bill detective ticket.....	216 00
"	Aaron Nathan, bill.....	10 00
"	F. A. Miller, premium and display of flowers.....	300 00
"	Lelia Curtis & Co., woodcut of stand.....	150 00
"	C. L. Knowles, on Pavilion.....	20 00
"	J. Liness, balance for work on stand.....	16 00
"	George Pardee, royalty on tickets and services..	143 00
"	Hiram Clark, on Pavilion.....	5 00
"	Chauncey Kane, driving race.....	15 00
"	D. M. Reavis, premium.....	225 00
"	D. M. Reavis, purse.....	300 00
"	Thos. Winters, premium.....	485 00
"	H. Whitaker, balance whitewashing.....	100 00
"	Landrum & Rogers, premium.....	210 00
"	W. J. Prather, premium.....	45 00
"	Mrs. M. E. Miller, premium.....	10 00
"	John Smith, premium.....	6 00
"	Carl Halverson, premium.....	40 00
"	W. S. Manlove, premium.....	31 00
"	D. H. Quinn, premium.....	30 00
"	J. F. Hill, premium.....	45 00
"	L. F. Chamberlin, premium.....	20 00
"	W. C. Nelson, premium.....	25 00
"	Carl Halverson, premium.....	15 00
"	Robert Beck, salary for September.....	166 66
"	Robert Beck, premium.....	135 00
"	Robert Beck, extra clerk hire, etc.....	500 00
"	Expense, Wells, Fargo & Co.'s express.....	4 40
"	Expense, pins.....	25
"	Thos. May, freight bill.....	5 75
October 5..	J. W. Neff, carpenter at Park.....	183 00
"	G. W. Mayberry, carpenter at Park.....	129 00
"	F. M. Marshall, carpenter at Park.....	75 00
"	M. Kraker, premium.....	55 00
"	F. Gabrille, premium.....	82 00

Date.	On what account.	Amount.
October 5..	Mrs. T. D. Scriver, tournament	$100 00
"	F. M. Chapman, livery bill	45 00
"	W. A. Sharon, carpenter at Park	100 00
"	P. M. Chatterton, carpenter at Park	250 00
"	F. J. Lewis, premium	100 00
"	Jesse Slaughter, Park bill	33 00
"	Jesse Slaughter, Pavilion bill	86 00
"	M. O'Mara, labor at Pavilion	34 25
"	Henry France, labor at Pavilion	75 50
"	W. A. Gett, labor at Pavilion	43 00
"	W. A. Prader, labor at Pavilion	43 00
"	L. B. Clark, labor at Park	24 00
"	J. P. Linton, labor at Pavilion	98 00
"	William Cooper, labor at Park	27 00
"	Hiram Crook, labor at Pavilion	50 50
"	James McGrath, labor at Pavilion	30 50
"	L. Callisch, labor at Pavilion	21 00
"	Chs. Moreno, labor at Pavilion	46 75
October 6..	W. F. Griggs, labor at Pavilion	49 50
"	W. D. Young, lighting gas at Pavilion	32 00
"	H. J. Haskell, ticket clerk	35 00
"	Wm. Crump, labor at Pavilion	28 00
"	Miss Mary McConnell, premium, tournament	75 00
October 9..	Nick Dole, police at Park	30 00
"	Ad. Maillaird, premium	180 00
"	W. J. Prather, premium	15 00
"	I. S. Bamber, premium	118 00
"	B. F. Stewart, police at Park	28 00
"	F. T. Johnson, ticket clerk at Park	35 00
"	H. S. Beals and —— White, ushers at Park	40 00
October 10	A. M. Smith & Co., plumbing at Park	142 00
"	G. W. Mayberry, watering trees at Park	100 00
"	F. S. George, interest on lots	93 75
"	Bush Brothers, plumbing at Park	473 80
"	William Landerkin, carpenter at Park	57 00
"	A. Meiss, labor and team at Park	273 75
"	Miss Woodbeck, premium	80 00
"	J. H. Carroll & Co., tubs	70 00
"	R. Stone & Co., premiums	23 00
"	J. W. C. Coleman, ticket clerk	35 00
"	S. Robinson, ticket clerk	15 00
"	F. Douglas, hay	31 00
"	William Hayne, premium	10 00
"	W. Guttenberger, premium	10 00
"	T. D. Scriver, horse for Marshal	35 00
"	J. C. Mills, premium	25 00
"	Mrs. Barton, premium	5 00
"	Frazee & Scullion, premium	10 00
"	F. M. Marshall, carpenter at Park	11 60
"	William Landerkin, carpenter at Park	32 50

Date.	On what account.	Amount.
October 10	A. Greer, premium....	$5 00
"	A. Ecbil, bill	5 00
"	De Bernardi & Selna, premium	30 00
"	A. B. Gilbert, premium	26 00
"	E. Giraud, bill	1 50
"	Pat. Clark, bill	2 37
"	Express wagon	3 50
"	Charles Warren, premium	20 00
"	F. Swift, errand boy	16 25
"	Sacramento Gas Company, bill	2 25
"	P. W. Taylor, police at Park	24 00
"	Mrs. George D. Stewart, premium	25 00
"	Bassett & Miller, premium	15 00
"	E. Hubbard, premium	40 00
"	C. F. Jones, premium	40 00
"	Miss Agnes Hummell, premium	3 00
"	Wells, Fargo & Co., envelopes	50
"	Mrs Winn, premium	5 00
"	J. F. Fugazi, premium	5 00
"	R. Butterfield, carpenter at Park	13 00
"	J. A. Lafferty, hauling	15 00
"	P. A. Miller, brick work at Park	11 50
"	Ackerman & Co., bill	1 50
"	John Baker, premium	15 00
"	Katie Van Voorhies, premium	3 00
"	W. C. Alford, labor at Park	2 50
"	W. Guttenberger, bill	1 00
"	Daniel Foley, police at Park	16 00
October 12	R. T. Bartlett, police at Park	20 00
"	William Oatman, ticket clerk	35 00
"	A. L. Hart, premium	16 00
"	N. L. Drew & Co., lumber for new stand	7,000 00
"	H. Seymour, Assistant Superintendent Agricultural Department	50 00
"	Hall's Safe and Lock Co., order to John Wall	51 00
"	Hall's Safe and Lock Co., H. G. Williams' subscription	10 00
"	Warren, old safe, taken at $125, in payment for new safe	214 00
"	L. A. Upson, premium	35 00
"	F. Foster, binding reports	75 00
October 13	Robert Chalmers, premium	50 00
"	F. M. Marshall, balance carpenter work at Park.	60 62
"	F. J. Lewis, filling diplomas	13 00
"	J. H. Carrington, premium	18 00
"	Sundry newspapers, advertising, as per bills filed.	358 25
"	Charles Ott, carpenter work at Park	112 00
October 14	F. Cox, premium	20 00
"	A. Meiss, labor and team at Park	72 00
"	J. H. Kent, hay at Park	20 25

Date.	On what account.	Amount.
Oct. 14.....	J. H. Kent, hay at Park.....	$25 16
Oct. 15.....	William Slater, carpenter work at Park.....	185 00
"	M. Fiedler, carpenter work at Park.....	64 00
"	W. K. Vanderslice & Co., silverware, 1873.....	246 96
"	O. P. Goodhue, boxes.....	9 20
"	John Huy, Marshal's horse.....	35 00
Oct. 17	J. D. B. Cook, labor at Park.....	28 00
"	J. B. Haggin, premium.....	142 50
"	M. L. Rollins, hose at Park.....	40 00
"	C. H. Krebs, painting new stand.....	400 00
"	Charles McGraw, drayage.....	6 00
"	*Record* printing office bill.....	410 00
"	Geo. Whitlock, decorating Pavilion, and labor...	50 00
"	O. C. Jackson, police at Pavilion.....	28 00
"	Hammond & Co., premium.....	30 00
"	Express charges.....	50
"	B. Arnold, premium	3 00
"	J. B. White, premium.....	5 00
"	Peter Burns.....	21 00
Oct. 19.....	C. L. Knowles, carpenter work, new stand.....	50 00
"	Hartwell, Hotchkiss & Co., mill work on new stand	500 00
Oct. 20.....	Robert Allen, labor at Park.....	41 25
"	E. F. Dole, police at Park.....	10 00
"	Wm. Van Wallet, premiums, 1873.....	10 00
"	Wm. Van Wallet, premiums, 1874	20 00
"	D. P. Diggs, premium.....	40 00
"	Salma's *Index*, advertising.....	12 00
Oct. 24.....	Interest to D. O. Mills & Co. to April first.....	4 35
"	Interest to D. O. Mills & Co. to May first.....	6 10
"	Interest to D. O. Mills & Co. to June thirtieth...	12 23
"	Interest to D. O. Mills & Co. to August first.....	26 71
"	Interest to D. O. Mills & Co. to August tenth....	9 38
"	Interest to D. O. Mills & Co. to October first.....	20 52
Oct. 26.....	Mattheny, labor at Park.....	32 00
Oct. 27.....	M. M. Chisholm, hauling at Park	27 00
Oct. 28.....	James Davis, for derrick.....	25 00
Nov. 1.....	Robert Beck, salary for October.....	166 66
"	F. S. George, lots bought, 1873.....	300 00
Nov. 3.....	J. R. Brown, insurance, new stand.	28 00
"	Post Office box rent.....	4 00
"	Ice bill.....	10 75
"	Hauling roller.....	50
"	Sweetser & Alsip, insurance on new stand.....	22 70
Nov. 4.....	John Harvey, premium	20 00
Nov. 5.....	Baker & Hamilton, bill	66 44
"	A. T. Hatch, premium.....	40 00
"	Joseph Blake, premium	20 00

Date.	On what account.	Amount.
Nov. 5.....	Seneca Daniels, premium.....	$125 00
Nov. 7.....	William Caswell, bill posting.....	30 00
Nov. 18.....	*Daily Bee*, advertising.....	57 00
"	Aaron Nathan, bill.....	35 00
"	B. Dennery, bill.....	23 75
"	J. W. Jackson, clerk hire.....	197 50
"	P. M. Chatterton, balance of carpenter work on Park.....	159 30
"	George Whitlock, balance services at Pavilion...	50 00
Nov. 19.....	W. F. Griggs, balance for labor at Pavilion.....	16 50
"	G. W. Hancock, Marshal.....	35 00
"	Capital Hotel, bill.....	7 00
Nov. 21.....	Sacramento *Journal*, advertising.....	10 00
"	John Parnell, entry clerk at Pavilion.....	35 00
Nov. 24.....	State Agricultural advertising.....	15 00
"	Parker & Perry, bill.....	7 00
Nov. 25.....	H. C. Kirk & Co., bill.....	37 73
Nov. 26.....	S. B. Emerson, premium on Opides.....	60 00
Nov. 27.....	F. J. Lewis, premium.....	25 00
Nov. 28.....	D. Gardner, wood.....	17 00
"	E. M. Smith, bill for stairs.....	40 00
"	L. Powers & Co., bill.....	38 00
"	G. H. Swinerton, bill.....	45 20
Dec. 1.....	Norton Bush, premium.....	150 00
"	Bush Brothers, premium.....	10 00
"	Bush Brothers, bill.....	5 15
"	Locke & Lavenson, bill.....	61 50
"	G. W. Carey, Assistant Superintendent.....	100 00
Dec. 2.....	Aug. Meiss, balance for work on new ground....	30 00
"	Theo. Winters, premium.....	100 00
"	Mrs. F. L. Maulove, premium.....	10 00
"	L. J. Orcutt, premium.....	55 00
Dec. 3.....	Robert Beck, salary for November.....	166 66
"	Sawing and carrying wood.....	1 75
"	Mrs. Welty, premium.....	5 00
"	James Touhey, balance for labor at Park.....	4 37
"	Express charges on Iowa reports.....	2 50
"	Dan. Murphy, bill.....	4 00
"	Telegrams.....	80
"	B. R. Prince, premium.....	25 00
"	James Carolan & Co., bill.....	45 90
"	Laufkotter Brothers, premium.....	50 00
"	Mrs. Hoover, premium.....	43 00
"	Robinson, Fowler & Co., premium.....	5 00
"	Mrs. Cronkite, premium.....	88 00
"	Seneca Daniels, premium, balance.....	25 00
Dec. 5.....	Dan. Flint, paid for cutting grass.....	7 00
"	Miss Mary Chambers, premium.....	5 00
"	H. Ekhart, bill.....	1 50
"	Corville & Co, premium.....	75 00

Date.	On what account.	Amount.
Dec. 9.....	D. Cooper, bill for hay.....	$5 50
"	Expense for matches.....	50
"	Drury Melone, interest.....	500 00
Dec. 10.....	N. L. Drew & Co., balance lumber bill.....	3,426 62
"	Charles L. Knowles, carpenter and Superintendent at Pavilion.....	225 00
"	A. Hamburger & Co., bill.....	20 50
"	Dale & Co.....	7 25
Dec. 12.....	J. J. Agard, insurance.....	38 00
"	R. T. Brown, salary as Treasurer.....	250 00
"	Hartwell, Hotchkiss & Co., balance bill.....	774 36
"	Wm. Crump, janitor at Pavilion.....	50 00
Dec. 15.....	James McGuire, account of iron fence.....	400 00
Dec. 19.....	H. Wachhorst, account of silverware.....	400 00
"	M. Hanrihan, wood	9 00
"	Nellie Lansing, premium.....	5 00
"	E. M. Smith, premium.....	10 00
"	Mrs. Hayden, premium.....	10 00
"	Mrs. Wilber, premium.....	10 00
"	Mrs. Gerish, premium.....	3 00
Dec. 21.....	Charles Sexton, labor at Park.....	4 00
"	James Anthony & Co., advertising, etc.	153 50
Dec. 22.....	Commercial Insurance Co., on Pavilion.....	37 50
"	California Insurance Co., on Pavilion.....	37 50
Dec. 23.....	C. H. Krebs & Co., account for painting stand...	500 00
"	S. H. Davis, bill for grand stand.....	96 55
"	W. L. Newell, ticket clerk at Park.....	52 50
"	John Brenner, bill for office furniture, etc.....	522 50
"	A. A. Cook, plans for grand stand.....	200 00
"	F. Jay Lewis, account for diploma.....	25 00
"	R. C. Terry & Co., gas fixings and plumbing at Park	142 50
"	R. C. Terry & Co., gas fixings and plumbing at Pavilion.....	164 74
"	R. C. Terry & Co., gas fixings and plumbing on stairs.....	43 00
"	H. S. Crocker & Co., bill for stationery and printing	483 03
Dec. 29.....	Miss A. Hummel, premium.....	5 00
"	F. Jay Lewis, filling diplomas.....	9 00
"	W. P. Coleman, insurance on grand stand.....	103 75
"	W. P. Coleman, insurance on Pavilion.....	82 50
Dec. 30....	Joseph Putnam, premium.....	5 00
Dec. 31....	Home Mutual Insurance Company, insurance on grand stand.....	31 25
"	B. Bullard, Jr., clerk.....	40 00
1875.		
Jan. 2.....	Keyt & Co., posting bills.....	10 00
"	Robert Beck, salary for December, 1874.....	166 66
Jan. 6.....	Wm. Crump, janitor at Pavilion for December...	50 00

Date.	On what account.	Amount.
Jan. 7.....	Alf. Estell, clerk of course and assistant entry clerk.....	$90 00
"	H. T. Holmes & Co., lime and cement for grand stand.....	44 25
Jan. 14.....	C. J. Zumwalt, premium.....	10 00
Jan. 17.....	Expense of postage stamps, currency $10.....	9 20
"	Expense of Post Office box rent.....	2 50
Jan. 18.....	A. P. Smith, premium.....	5 00
"	Miss F. M. Smith, premium.....	10 00
Jan. 25.....	F. M. Marshall, carpenter at Park.....	30 00
"	Daniel Murphy, carriage hire.....	4 00
Jan. 26.....	H. P. Osborn, wood.....	9 00
		$65,789 43

CONSTITUTION

OF THE

STATE AGRICULTURAL SOCIETY.

CONSTITUTION

OF THE

CALIFORNIA STATE AGRICULTURAL SOCIETY.

ARTICLE I.—NAME.

SECTION 1. This society shall be called "The California State Agricultural Society."

ARTICLE II.—OBJECT.

SECTION 1. It shall be the object of this society to encourage the cultivation of the soil and the general development of all the agricultural resources of this State.

SEC. 2. To foster every branch of mechanical and household arts calculated to increase the happiness of home life.

SEC. 3. To extend and facilitate the various branches of mining and mining interest.

ARTICLE III.—MEMBERSHIP.

SECTION 1. *Annual Members.*—Any person who has, during the year eighteen hundred and sixty-five, or who shall, during this year or any subsequent one, pay into the funds of this society the sum of five dollars, may become a member of the same; such membership to expire on the thirty-first day of the following December.

SEC. 2. *Life Members.*—Any person may become a member for life by the payment of fifty dollars; or, if already a member, by the payment of forty dollars, and shall thereafter be exempt from all dues and assessments.

SEC. 3. *Honorary and Corresponding Members.*—Any person whom the Board shall propose may be elected an honorary or a corresponding member, and shall enjoy, free of charge, all the privileges of the society, except voting and holding office.

SEC. 4. *Privileges of Members.*—Any citizen of this State, being a member of this society, shall be eligible to office, entitled to vote, and enjoy the free use of the library, under the rules of the same, and have

free admission, accompanied by his wife and minor children, to all the exhibitions of the society, and shall be permitted to compete for premiums in any or all departments.

SEC. 5. *Expulsion of Members.*—Any member who shall present for exhibition any article or animal which he is not entitled by the rules of the society to exhibit, or who shall attempt to deceive, or be guilty of a breach of good faith toward the society, may be expelled by a vote of two thirds of the members present at any meeting of the society; *provided*, always, that no member shall be expelled unless written notice of the alleged offense shall have been served on him, or left at his usual place of residence at least twenty days previous to the action.

ARTICLE IV.—OFFICERS.

SECTION 1. The officers of this society shall consist of a President and nine Directors, who shall constitute a State Board of Agriculture, five of whom shall constitute a quorum. They shall elect a Treasurer and Secretary, not members of the Board. They may also appoint annually, as officers of the Board, a chemist, a botanist, a meteorologist, a geologist, a metallurgist, an ornithologist, and an entomologist, and define the duties of each. They may appoint such committees on the various departments of agriculture, mining, and manufactures, either generally or for specific purposes, as they may deem important for the best interests of the State, and require such committees to report the results of their investigations to the Board at such times as may be named by them.

SEC. 2. *Duties of President.*—The President shall preside at all meetings of the Board, and of the society; shall have power to call special meetings of the Board when necessary, and at the written request of ten members, may call extra meetings of the society; shall appoint all meetings not otherwise provided for; shall vote only at the election of officers, and in case of a tie; and shall sign all financial and official documents emanating from the society not otherwise provided for. In the absence of the President from any meeting of the Board or society, any Director may be called to the chair, and during such meeting, and for the completion of any business transacted or ordered at the same, shall have the same powers as the President.

SEC. 3. *Duties of Secretary.*—The Secretary shall conduct the correspondence of the society, keeping in a separate book copies of all letters written in the name or on behalf of the society, holding the same free to the inspection of any member of the society, at any regular meeting of the same. He shall also receive and file all letters addressed to the society, holding the same subject to the Board of Directors. He shall attend all meetings of the society and the Board, keeping a full record of the doings of each in a separate book, and shall furnish a copy of the proceedings of each meeting to the Committee on Publication within five days after the close of such meeting. He shall prepare and publish all notices of meetings, shall keep a roll of all standing committees, and call the same (noticing absences) whenever desired to do so by the Chair; shall sign all certificates of honorary and corresponding memberships, and forward the same to those entitled to receive them. He shall keep, in a book prepared for that especial purpose, the name and address of every member; shall prepare and sign all gratuitous or complimentary cards or tickets of admission; shall countersign all diplomas, certificates of merit, etc., awarded by the society, and forward the same to their respective

claimants. He shall be ex officio Librarian; shall keep the seal, and all the plates, dies, engravings, etc., belonging to the society, and shall cause to be struck therefrom such medals and impressions as may from time to time be required. He shall have charge of all specimens, models, plants, seeds, books, etc., and arrange, prepare, or distribute the same under the direction of the Board. He shall prepare all reports to be made by the Board to the society, and all reports to be made by the society to the State. He shall receive all moneys due or payable to the society, and pay the same to the Treasurer, taking his receipt therefor; shall hold all bonds filed by officers of the society for the faithful performance of their duty, and all vouchers for every class of expenditure. He shall countersign all drafts ordered by the Board, and all certificates of annual and life membership, and keep an account of the same, in a separate book, as they are issued, and shall, in December of each year, prepare a tabular statement of the receipts and expenditures of the society, according to the law incorporating the same. For which services he shall receive such compensation as the Board shall decide to pay.

SEC. 4. *Duties of the Treasurer.*—The Treasurer shall receipt for all funds at the hands of the Secretary, and shall disburse the same only on the order of the Board, attested by the President and the Secretary. He shall also hold in trust all certificates of stock, bonds, notes, deeds, or other evidences of debt or possession belonging to the society, and shall transfer, invest, or dispose of the same only by direction of the society, or by a written order of the Board. He shall, within ten days after his election, file with the Secretary a bond for the faithful performance of his duties; said bond to be approved by the Board and to be in a sum equal to twice the combined amounts of the funds on hand and the estimated revenue for the year; and shall, at the annual meeting, make to the society a detailed report of all his doings; for which services he shall receive such compensation as the Board shall from time to time decide to pay.

SEC. 5. *Duties of the Board.*—The Board of Managers shall have the general and financial management of all the affairs of the society in the interim of annual meetings. It shall fill all vacancies occurring between elections, and shall make the necessary preparations and arrangements for all meetings, fairs, exhibitions, etc. The Board shall also have power to make its own by-laws (not inconsistent with this Constitution) and arrange the time and place of its own meeting.

ARTICLE V.—STANDING COMMITTEES.

SECTION 1. *Committee of Finance.*—The Committee of Finance shall consist of three (the President and Secretary being two), whose duty it shall be to audit the Treasurer's account, to examine and approve all bills before they are paid, to have general supervision of the finances of the society, and to report their doings in full to the Board whenever called on so to do.

SEC. 2. *Library Committee.*—The Library Committee shall consist of three (the Secretary being one), whose duty it shall be to have the general supervision of the library and cabinet, to make all necessary rules and regulations for the government of the same (said rules and regulations being subject to the approval of the Board), to suggest such means for the safe keeping and enlargement of both the library and cabinet as

they may deem expedient, and to make a full report of their doings, together with the state of the department under their charge, at each annual meeting.

SEC. 3. *Visiting Committee.*—The Visiting Committee shall consist of three, whose duty it shall be to visit and examine all farms, orchards, vineyards, nurseries, field crops, mining claims, ditches, mills, etc., which may be entered for competition, and which shall require examination at other times and places than the annual Fair; to award premiums for the same, according to the schedule, and recommend such gratuities as they may deem proper, and make a full report to the Board at least one day previous to the annual meeting.

SEC. 4. *Committee on Publication.*—The Committee on Publication shall consist of three (the President and Secretary being two), whose duty it shall be to contract for and superintend, under the direction of the Board, all printing and publishing necessary for the prosperity of the society.

ARTICLE VI.—DONATIONS AND BEQUESTS.

SECTION 1. All donations, bequests, and legacies to this society, designated by the donors for any particular purpose embraced within the objects of the society, shall be with strict fidelity so applied; and the name of each donor, together with the amount and description of such donation, and the object for which it was designated, shall be registered in a book kept expressly for that purpose.

ARTICLE VII.—MEETINGS AND EXHIBITIONS.

SECTION 1. *Exhibitions.*—The society shall hold an annual Fair and Cattle Show in the City of Sacramento, and may, at its discretion, hold such other exhibitions as it may deem conducive to the interests of agriculture.

SEC. 2. *Annual Meeting.*—The annual meeting shall be held at the Capital of the State, at such time during the month of January in each year as the Board may designate, at which time all the officers from whom reports of the preceding year's service are required shall present the same, and all officers for the ensuing year shall be elected by ballot; and all officers shall continue in office until their successors are duly qualified.

SEC. 3. *Special Meetings, how called.*—No special meeting of the society shall be called but upon thirty days notice in the columns of a newspaper published in each of the Cities of San Francisco, Sacramento, Marysville, and Stockton; nor without a request signed by at least ten members.

SEC. 4. *Proxy Voting.*—It shall not be admissible for any member to vote by proxy in any meeting of this society, or its Board of Managers.

SEC. 5. *Quorum of the Society.*—At any meeting of this society, fifteen members (a majority of whom shall represent counties other than the one where the meeting shall be held) shall constitute a quorum.

ARTICLE IX.—OFFICE AND ROOMS.

SECTION 1. The office, rooms, library, and cabinet of the society shall be permanently located at the Capital of the State.

ARTICLE X.—AMENDMENTS.

Section 1. Amendments to this Constitution must be presented in writing at an annual meeting, when, if unanimously agreed to, they shall be adopted; but if there be objection, and a majority consent thereto, they shall be spread upon the minutes and lie over until the next annual meeting, when they shall be read, and if, after due discussion, two thirds of all the members present vote for the amendments, they shall be adopted and become a part and parcel of this Constitution.

ARTICLE XI.—EFFECT.

Section 1. This Constitution shall take effect from and after its passage.

I certify the foregoing to be a true copy of the Constitution of the California State Agricultural Society, as amended by unanimous consent at the annual meeting of the society, held on the twenty-eighth day of January, A. D. eighteen hundred and sixty-nine.

I. N. HOAG,
Corresponding Secretary.

COMPILATION OF LAWS

RELATING TO THE

STATE AGRICULTURAL SOCIETY.

A COMPILATION

OF ALL THE LAWS NOW IN FORCE RELATING TO OR AFFECTING THE STATE AGRICULTURAL SOCIETY.

AN ACT

TO INCORPORATE A STATE AGRICULTURAL SOCIETY AND APPROPRIATE MONEY FOR ITS SUPPORT.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. There is hereby established and incorporated a society to be known and designated by the name and style of the "CALIFORNIA STATE AGRICULTURAL SOCIETY," and by that name and style shall have perpetual succession, and shall have power to contract and be contracted with, to sue and be sued, and shall have authority to have and use a common seal, to make, ordain, and establish, and put in execution such by-laws, ordinances, rules, and regulations as shall be necessary for the good government of said society, and the prudent and efficient management of its affairs; *provided*, that said laws, ordinances, rules, and regulations shall not be contrary to any provision of this charter, nor the laws and Constitution of this State or of the United States

SEC. 2. In addition to the powers above enumerated, the society shall, by its name aforesaid, have power to purchase and hold any quantity of land not exceeding four sections, and may sell and dispose of the same at pleasure. The said real estate shall be held by said society for the sole purpose of establishing a model experimental farm or farms, erecting inclosures, buildings, and other improvements calculated and designed for the meeting of the society, and for an exhibition of the various breeds of horses, cattle, mules, and other stock, and of agricultural, mechanical, and domestic manufactures and productions, and for no other purposes.

And be it further enacted, That if, from any cause, said society shall ever be dissolved, or fail to meet within the period of two consecutive years, then the real estate held by it, together with all the buildings and appurtenances belonging to said estate, shall be sold as lands are now sold by execution, and the proceeds deposited in the State Treasury, subject to the control of the Legislature.

AN ACT

SUPPLEMENTAL TO AN ACT TO INCORPORATE A STATE AGRICULTURAL SOCIETY, APPROVED MAY THIRTEENTH, EIGHTEEN HUNDRED AND FIFTY-FOUR, AND AMENDED MARCH TWENTIETH, EIGHTEEN HUNDRED AND FIFTY-EIGHT.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. The general prudential and financial affairs of the society shall be intrusted to a Board of Agriculture, to consist of a President and nine Directors, five of whom shall constitute a quorum.

[Amended section.]

SEC. 2. Said Board of Agriculture shall be elected at a general State Agricultural Convention, to be held at the Capital of the State, in the year eighteen hundred and sixty-three, in the month of March, and in the month of January every year thereafter, to consist of the life members and annual members of the State Agricultural Society and four delegates from each County Agricultural Society within this State, incorporated under the general laws of this State for such corporations, and an equal number from each District Agricultural Society, also incorporated under the general laws of this State for such purposes; said delegates to be chosen at the annual Fair or annual meeting of each such society next preceding the State Agricultural Convention; *provided*, said Convention to be held in March, in the year eighteen hundred and sixty-three, may admit any person or persons representing any of said County or District Agricultural Societies, as the Convention may determine by a majority vote, whether such persons shall have been elected by their respective County or District Societies, as provided in this Act, or not.

SEC. 3. The Board of Agriculture shall, at its first meeting after its election, be divided by lot into three equal portions (omitting the President), one portion to continue in office one year, one portion two years, and one portion three years; one third of the number, together with the President, to be elected at the State Agricultural Convention annually thereafter; the Directors to hold office three years.

SEC. 4. The Board of Agriculture may, in the absence of the President, choose one of its other members temporary Chairman. They shall elect a Treasurer and Secretary, not members of the Board, prescribe their duties, fix their pay; and the said Treasurer and Secretary shall be subject to removal at any time by a majority of said Board.

SEC. 5. The Board of Agriculture shall use all suitable means to collect and diffuse all classes of information calculated to aid in the development of the agricultural, stock raising, mineral, mechanical, and manufacturing resources of the State; shall hold an annual exhibition of the industry and products of the State; and, on or before the first day of January of each year in which the Legislature shall be in regular session, they shall furnish to the Governor a full and detailed account of all its transactions, including all the facts elicited, statistics collected, and information gained on the subject for which it exists; and also a distinct financial account of all funds received, from whatever

source, and of every expenditure, for whatever purpose, together with such suggestions as experience and good policy shall dictate for the advancement of the best interests of the State; the said reports to be treated as other State documents are.

Sec. 6. The Board of Agriculture shall have power to appoint a suitable number of persons to act as Marshals, who shall be, from twelve o'clock, noon, of the day previous to the opening of the exhibition until noon of the day after the close of the same, vested with all the powers and prerogatives with which Constables are invested, so far as acts or offenses committed within, or with reference to, or in connection with, the exhibition are concerned.

Sec. 7. The Board of Agriculture may, in its discretion, award premiums for the best cultivated farms, orchards, vineyards, gardens, etc.; *provided*, that said Board shall not audit, allow, or pay an amount exceeding one thousand dollars in any one year for traveling expenses of Visiting Committees in examining said farms, et cetæra; *provided* further, that no person except practical agriculturists shall be appointed on said committees.

Sec. 8. It shall be optional with any to whom a premium is awarded to receive the article named or its equivalent (as affixed) in coin.

Sec. 9. The State Agricultural Society shall have power, at its first annual meeting after the passage of this Act, to make such alterations in its Constitution as shall make it conform to the provisions of this Act.

Sec. 10. All Acts or provisions in conflict with the provisions of this Act are hereby repealed.

Sec. 11. This Act shall take effect from and after its passage.

AN ACT

FOR THE ENCOURAGEMENT OF AGRICULTURE AND OTHER INDUSTRIES, APPROVED MARCH TWENTY-FIRST, EIGHTEEN HUNDRED AND SEVENTY-TWO.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

Section 1. There is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of five thousand dollars for the State Agricultural Society, the sum of three thousand dollars for the Bay District Agricultural Society, and the sum of two thousand dollars for each of the following named societies, viz: the Los Angeles District Agricultural Association, the Santa Clara Valley Agricultural Society, the Sonoma and Marin District Agricultural Society, the San Joaquin Valley District Agricultural Society, the Northern District Agricultural, Horticultural, and Mechanical Society, the Upper Sacramento Agricultural Society, the Siskiyou County Agricultural Society, and the Bay District Horticultural Society, and the California Vine Growers' and Wine and Brandy Manufacturers' Association, for each of the years eighteen hundred and seventy-two and eighteen hundred and seventy-three. Upon presentation of the requisition of the President and Secretary of either of the societies above named to the State

Controller, the Controller shall draw his warrant on the Treasurer in favor of such society for the amount appropriated to such society, and the Treasurer shall pay the same. The money so drawn by each society shall be used for the purpose of paying premiums for the various agricultural, mineral, mechanical, and manufacturing products of this State, and for no other purpose.

SEC. 2. The Directors of each of the above named societies, except the State Agricultural Society, shall each year report to the State Board of Agriculture the name and Post Office address of each of the officers of such society, on or before the first day of May; and on or before the first day of December of each year they shall report to said Board of Agriculture the transactions of said society, including the list of articles exhibited and premiums awarded; the amount of receipts and expenditures of the year, and the objects for which the expenditures have been made; the new industries inaugurated and new products produced, and any and all other facts showing the development of the resources of the district embraced in such society, which they may deem worthy of such report.

SEC. 3. The State Board of Agriculture shall report annually, on or before the fifteenth day of January, to the Governor of the State, the full transactions of the State Society, including the facts and statistics collected and information gained on the subjects for which it exists; also including the report from each of the above named societies, or so much thereof as said Board may deem of value for publication.

SEC. 4. The Governor shall cause five thousand volumes of said report of the State Board of Agriculture to be printed each year, at the expense of the State, and paid for as other public printing, and delivered to the State Agricultural Society for general distribution.

SEC. 5. All laws or parts of laws conflicting with the provisions of this Act are hereby repealed.

SEC. 6. This Act shall take effect and be in force from and after its passage.

PLANTING SHADE TREES.

To give the following law as much prominence as possible, and at the same time give the efforts made by the Board to give it life and form, the following circular is introduced here. It was sent, as indicated, to all the Boards of Supervisors and the press, and many private individuals of public spirit:

ROOMS CALIFORNIA STATE BOARD OF AGRICULTURE,
SACRAMENTO, October 20th, 1872.

To the Board of Supervisors of the County of ——— :

GENTLEMEN: I am directed by the State Board of Agriculture to call your attention to an Act to encourage the planting and cultivation of shade and fruit trees upon the public roads and highways of this State, approved March thirtieth, eighteen hundred and sixty-eight. The following is a true copy of the Act referred to:

AN ACT

TO ENCOURAGE THE PLANTING AND CULTIVATION OF SHADE AND FRUIT TREES UPON THE PUBLIC ROADS AND HIGHWAYS OF THIS STATE.

[Approved March 30th, 1868.]

The People of the State of California, represented in Senate and Assembly, do enact as follows:

Section 1. The Board of Supervisors of any county of this State may, by an order of such Board, to be passed at a regular meeting of such Board and to be entered in the minutes thereof, authorize the planting and cultivation of shade and fruit trees, by persons owning lands in such county, upon the public roads and highways adjacent to such lands.

Sec. 2. The Board of Supervisors may, by order entered upon their minutes, designate the roads or highways upon which such trees may be planted, so describing such road, by reference to places and boundaries, that the same may be readily ascertained. They shall also, in such order, direct the species of trees to be so planted, their age when planted, their distance from each other, and their position with reference to the traveled road, and also all such other rules and regulations as they shall deem proper to secure the proper planting, growth, and protection of such trees, and also to prevent their obstructing the travel upon such road.

Sec. 3. Whenever any person shall plant, upon any public road, in front of land owned by him, shade or fruit trees, in accordance with the provisions of this Act, and also of such rules as the Board of Supervisors may prescribe hereunder, such person so planting such trees shall file with the Board of Supervisors of such county a written statement, setting forth therein the road or places upon which such trees are planted, the number and species of trees thus planted, and the time of planting.

Sec. 4. Four years from and after the date of planting such trees and giving the notice as provided in section third, the person planting such trees, or his legal representative, may present to the Board of Supervisors of such county his statement in writing, verified by the oath of such applicant, setting forth therein the number and species of trees originally planted, when and by whom planted or caused to be planted, and the number then living and in a thrifty condition; and for any willful misstatement contained in such report the party making the same may be prosecuted for the crime of perjury.

Sec. 5. Upon filing such verified statement, the Board of Supervisors of such county shall allow to the party making the same the sum of one dollar for each and every tree so planted and growing thriftily, the same to be audited and paid out of the General Fund of such county as other claims are allowed, audited, and paid.

Sec. 6. Nothing contained in this Act shall be construed to apply to any trees planted before the passage of this Act, or unless planted and cultivated as required by the orders of the Boards of Supervisors.

Sec. 7. This Act shall be in force from and after its passage.

You will see by the above that you are authorized by the Legislature to encourage the planting of trees on either side of every public road in

your county. In the opinion of the Board, you could perform no act likely to result in such undoubted and general benefit to your county and people as the placing upon your records the proper orders for carrying into effect the provisions of the above law. We could name many reasons in favor of your action in this respect, but we do not deem it necessary. These reasons will occur to every intelligent mind, and we trust will secure your early and favorable action, so that the tree planting may be initiated and executed to a considerable extent during the approaching planting season. We would suggest, however, that no trees be allowed to be planted nearer than twelve feet from each other; that trees between three and eight years from the seed would be preferable as to age, and would recommend the following varieties as hardy, of rapid growth, and many of them valuable for wood or timber: Black and Honey Locusts; Black, White, and Fruiting Mulberry; Osage Orange, Native and Eastern Black Walnut; American Chestnut; European, American, and Cork Bark Elm; the different kinds of Maple; the Tulip Tree; Carolina, Lombardy, and Silver Leaf Poplar; different kinds of Ash; the Apple, Pear, Plum, Cherry, Almond, and Fig, Eucalyptus, or Australian Blue and Red Gum; Monterey Pine, Sugar Pine, Yellow Pine, Spruce Pine, Norway Spruce, Balsam Fir, Scotch Pine, European Larch, Monterey Cypress, Italian Cypress, California Redwood, California Laurel, and such other kinds as your Board may deem of value for your county.

Hoping you will take early and favorable action in this important matter, we are, respectfully, etc., by order of the Board,

ROBT. BECK, Secretary.

ANIMALS EXHIBITED AT THE PARK.

ANIMALS EXHIBITED AT THE PARK.

THOROUGHBRED HORSES.

STALLIONS.

Best stallions four years old and over.

S. C. McCollough, Lima, Ohio—Jerry Sparkle, sired by Bleakwind, by Lexington; dam, an Embassador mare.

John Hall, Alvarado—Ben. Wade, sired by Woodburn; dam, Moss Rose, by imported Knight of St. George.

Theodore Winters, Solano County—Norfolk, sired by Lexington; dam, Novice, by imported Glencoe.

John Boggs, Colusa—Langford, sired by Belmont; dam, Liz. Givens, by imported Langford.

George Treat, San Francisco—Thad. Stevens, sired by Langford; dam, Mary Chilton, by Glencoe.

J. Cairn Simpson, Oakland—Craigie Burn, sired by imported Bonnie Scotland; dam, Maggie Mitchell, by imported Yorkshire.

Best three years old.

John Hall, Alvarado—Tom, sired by Woodburn; dam, Peggy Ringgold.

James Mee, San Francisco—Eureka, sired by Young Eclipse; dam, Milly, by Slasher.

John Hall, Alvarado—Woodbury, sired by Woodburn; dam, Moss Rose.

J. Cairn Simpson, Oakland—Three Cheers, sired by imported Hurrah; dam, Lady Lancaster.

Best two years old.

Theodore Winters, Solano County—Major Bradley, sired by Norfolk; dam, Margarita, by Lexington.

Theodore Winters, Solano County—Bill Newell, sired by Norfolk; dam, by Owen Dale.

Wm. Boots, San José—Nathan Coombes, sired by Lodi; dam, Miami.

Best one year old.

Wm. Boots, San José—Bob Wooding, sired by imported Hercules; dam, Miami.

Best colt under one year old.

John Hall, Alvarado—Basswood, sired by Woodburn; dam, Moss Rose.

Theodore Winters, Solano County—No. 1, sired by Norfolk; dam, Hennie Farrow.

Theodore Winters, Solano County—No. 2, sired by Norfolk; dam, Lou. Barnes; grand dam, by Winnebago.

Theodore Winters, Solano County—No. 3, sired by Norfolk; dam, Nevada, by Billy Cheatham.

Wm. Boots, San José—No name.

MARES.

Best mare four years old and over, with colt.

John Hall, Alvarado—Moss Rose and colt; Moss Rose, sired by imported Knight of St. George; dam, imported Melrose.

Theodore Winters, Solano—Hennie Farrow and colt; Hennie, sired by imported Shamrock; dam, by imported Belshazzar.

Theodore Winters, Solano—Nevada and colt; Nevada, sired by Billy Cheatham; dam, Evadne, by Winnebago.

Wm. Boots, San José—Lizzie Marshall and colt; Lizzie Marshall, sired by Lodi; dam, Ellen Jordan.

Best four years old and over.

John Hall, Alvarado—Peggy Ringgold, sired by Ringgold; dam, Little Peggy, by Cripple.

Theodore Winters, Solano—Lou. Barnes, sired by Belmont; dam, Evadne, by Winnebago.

Wm. Boots, San José—Miami, sired by Belmont; dam, Maria Downing.

Best three years old and over.

Charles Murphy, San José—Mary Watson, sired by imported Hercules; dam, by Independence, he by old Boston.

R. T. O'Hanlon, San José—Fanny Hall, sired by Norfolk; dam, Miami, by Belmont.

J. Cairn Simpson, Oakland—Marion, sired by Malcolm; dam, Maggie Mitchell, by imported Yorkshire.

Best two years old.

No entry.

Best one year old.

John Hall, Alvarado—Rosewood, sired by Woodburn; dam, Moss Rose.

Theodore Winters, Solano—Molly McCarty, sired by Monday; dam, Hennie Farrow.

Best mare colt under one year.

John Hall, Alvarado—No name, sired by Woodburn; dam, Peggy Ringgold.

FAMILIES.

Best thoroughbred sire with not less than ten of his colts, all thoroughbred.

Theodore Winters, Solano—Norfolk and ten of his colts.

Best thoroughbred dam with not less than four of her colts, all thoroughbred.

John Hall, Alvarado—Moss Rose and colts, Ben. Wade, Woodbury, Hardwood, Rosewood, and Basswood.
Theodore Winters, Solano—Hennie Farrow and colts.

Best stallion, other than thoroughbred, with not less than ten of his colts.

D. M. Reavis, Chico—Blackbird and ten colts; Blackbird, sired by old Blackbird; dam, a Messenger mare.
Mr. Hamilton, San José—Ethan Allen, Jr., and ten colts.

Best dam, other than thoroughbred, with not less than three of her colts.

A. Musick, Sacramento—Sally Franklin and colts, Monarch, Alexander Selkirk, Emma Skaggs, Vanderbilt, all by Norfolk.
William Hamilton, San José—Santa Clara and colts.
William Hamilton, San José—Winona and colts.
A. M. Plummer, Sacramento—Harry Williams and colts.

GRADED HORSES.

Best stallion, four years old and over.

Thomas Edwards, Sacramento—Phil. Sheridan, sired by Norfolk; dam, a Rattler mare.
J. D. Carr, Gabilan—Carr's Membrino.
William H. Shear, San Francisco—Sir Richard.

Best stallion three years old.

No entry.

Best stallion two years old.

Theodore Winters, Solano—Scamperdown, sired by Norfolk; dam, Nettie W., by Belmont.

Best stallion one year old.

Theodore Winters, Solano—John Tyree, sired by Norfolk; dam, Fanny Howard, by Illinois Medoc.
E. H. Miller, Jr., Sacramento—Blackbird, sired by Blackbird; dam, Addie Lee.

Best colt under one year.

No entry.

Best mare four years old and over, with colt.

Samuel Barnes, Cache Creek—Mary and colt, sired by Odd Fellow; dam, Whip, a Yorkshire mare.

Charles H. Shear, Sacramento—Alicia Mandeville and colt, sired by Boston Boy; dam, Peggy Magel.

William Hamilton, San José—Winona and colt; Winona, sired by Ill. Medoc; dam, unknown.

E. M. Skaggs, Sacramento—Sacramento Belle.

Best mare four years old and over.

G. H. Trinder, Cache Creek—Nannie Gordon, sired by Cashier, he by Cheatham; dam, unknown.

Samuel Barnes, Cache Creek—Skilletfoot, sired by Ned Murray, by Winnebago; dam, a Printer mare.

William Hamilton, San José—Santa Clara, sired by Owen Dale; dam, an Emerson mare.

D. P. Diggs, Yolo—Minnie Ball, sired by Norfolk; dam, Brooklyn Maid, by Odd Fellow; grand dam, Lola Montez.

George Bemont, Napa—Amelia, sired by General Taylor; dam by American Boy.

Best mare three years old.

Samuel Barnes, Cache Creek—Snip, sired by Didapper, he by Bulwer; dam, a Whip mare.

D. M. Reavis, Chico—Flora, sired by Blackbird; dam by John Morgan.

William Hamilton, San José—Jane, sired by Ethan Allen, Jr.; dam by Owen Dale.

Best mare two years old.

William Hamilton, San José—Emma, sired by Ethan Allen, Jr.; dam by Owen Dale.

G. W. Scott, Cache Creek—Sally Hawkins.

Best mare one year old.

D. M. Reavis, Chico—Nellie, sired by Blackbird; dam, a Gleneoe mare.

William Hamilton, San José—Kate, sired by Ethan Allen, Jr.; dam by Belmont.

A. L. Chapman, Suisun—Lady Norfolk, sired by Norfolk; dam, Black Maggie, by Tom Clay.

HORSES OF ALL WORK.

STALLIONS.

Best four years old and over.

W. P. A. Craig, Rye Patch, Nevada—Louis, sired by imported Louis I; dam, Gray Eagle, a Rattler mare.

J. E. Young, Capay, Yolo County—Pacific, sired by Seal; dam, a Silverheels mare.

G. Bassett, Sacramento—Honest Charley, sired by a Messenger horse; dam, a Morgan mare.

J. J. Bell, Clear Creek, Shasta County—Duke, sired by Culver Morgan; dam, a Messenger mare.

George Hack, Sacramento—Senator Booth, sired by Tecumseh; dam, unknown.

A. J. Scroggins, Colusa—Henry Belmont, sired by Belmont; dam, unknown.

Charles King, Tehama County—Orphan Boy, sired by Orphan Boy; dam, a Gray Eagle mare.

Sullivan Treat, Elk Grove—Comet, sired by David Hill; dam, unknown.

James Clark, Colusa—Messenger Boy, sired by a Messenger horse; dam, a Morgan mare.

Harms & Palm, Yolo County—Yolo Chief, sired by Clydesdale; dam, a St. Clair mare.

James S. McCue, San Francisco—Copperhead, sired by Owen Dale; dam, unknown.

A. M. Plummer, Sacramento—Black Eagle, Jr., sired by old Black Eagle; dam, unknown.

W. S. Ferguson, Latrobe—Honest John, sired by Tom Moore; dam, Lalla Rookh.

Alonzo Joy, Drytown—Young Hamiltonian, sired by Vermont Morgan; dam, an English coach mare.

P. M. Wain, Sacramento—Morgan coach horse.

Best stallion three years old.

Wm. Hamilton, San José—Justice, sired by Ethan Allen, Jr.; dam, by St. Lawrence.

Best stallion two years old.

Wm. Hamilton, San José—Tom Scott, sired by Ethan Allen; dam, by Owen Dale.

John Henry, Yolo—Henry Ward Beecher, sired by Dietz St. Clair; dam, a Messenger mare.

Best stallion one year old.

Wm. Hamilton, San José—Black Allen, sired by Ethan Allen, Jr.; dam, by Belmont.

Mark Hopkins, Sacramento—Graff, sired by Fred. Low; dam, a Kentucky Whip mare.

W. A. Findley, Wheatland—Billy, sired by Young Signal; dam, a Lomax mare.

Best mare four years old and over, with colt.

W. P. A. Craig, Rye Patch, Nevada—Flora and colt.

George Hack, Sacramento—Nellie Grant and colt; Nellie Grant, sired by Blackbird; dam, a Morgan mare.

Carl Halverson, Patterson's Station—Belle and colt; Belle, sired by St. Clair; dam, a Planter mare.

J. C. Gould, San José—Liz. and colt; Liz., sired by Mayday; dam, a Messenger mare.

E. D. Camfield, Sacramento—Alice and colt; Alice, sired by George Moore, Jr.; dam, unknown.

W. A. Findley, Wheatland—Lady and colt.

W. A. Findley, Wheatland—Maggie and colt.

S. Eaton, Marysville—Lola and colt.

S. Eaton, Marysville—Nelly and colt.

Best mare four years old and over.

E. Pierce, Sacramento—Sally Moore, sired by George Moore; dam, Nelly Morgan.

E. J. Sparks, Lincoln—Mary, sired by Clydesdale; dam unknown.

James McComb, Dixon—Solano Maid, sired by Rattler; dam, a Rattler mare.

Wm. M. Haynie, Sacramento—Camilla Urso, sired by Tecumseh; dam, a Messenger mare.

J. Sessions, Oakland—Lady Livingston, sired by California Chief; dam, Lady Livingston.

J. C. Gould, San José—Liz.

Best mare three years old.

E. Pierce, Sacramento—Lucy Moore, sired by George Moore, Jr.; dam, Nelly Morgan.

Wm. M. Haynie, Sacramento—Grace Darling, sired by Tecumseh; dam, Messenger, a Blackbird mare.

P. Morrissy, Yolo—Susan Moore, sired by George Moore, Jr.; dam, a Lomax mare.

Best mare two years old.

Mark Hopkins, Sacramento—Belle.

J. C. Gould, San José—Pet, sired by Ethan Allen, Jr.; dam, Liz.

G. W. McWain, Marysville—Maggie.

DRAFT HORSES.

STALLIONS.

Best four years old and over.

John Munson, San Francisco—Robert Bruce, sired by imported Black Prince; dam, Normandy mare Nellie, imported.

C. Hubbard, Sacramento—William Wallace, sired by William Wallace; dam, a King George mare, her dam a Robin Hood mare.

Best three years old.

McCarty & Lupham, San Francisco—Judge Templeton, sired by Emperor; dam, Jessie, a Clydesdale mare.

H. Unger, Collinsville—Dick.

Best two years old.

William F. McCracken, Freeport—George, sired by a Clydesdale stallion; dam, a Tigerwhip mare.

Best one year old.

John Gosling, Sacramento—Prince June, sired by Prince June; dam, unknown.

MARES.

Best four years old and over, with colt.

John Neal, Sacramento—Eliza and colt Eliza.

Best four years old and over.

Chris. Thodt, Dixon—Kate.

Best three years old.

W. B. Gibson, Woodland—Betsy.

Best two years old.

Chris. Thodt, Dixon—Lucy, sired by Tickle-my-Fancy; dam, Kate.

Best one year old.

No entry.

ROADSTERS.

STALLIONS.

Best four years old and over.

R. C. De Nise, Nicalaus, Sutter County—Taylor, sired by General Taylor; dam, a Black Hawk and Morgan mare.

George W. Thom, Walnut Creek, Contra Costa County—Gold Dust, sired by Emigrant; dam, an Eclipse mare.

Adam Newbauer, Sacramento—Young Washington, sired by Tecumseh; dam, a St. Clair mare.

Herman Schlutius, Franklin—Lightning, Jr., sired by Young Lightning; dam, a Lomox mare.

Stephen W. Freeman, Franklin—John B. Weller, sired by McCracken's Blackhawk; dam, a Morgan mare.

Jesse D. Carr, Gabilan (graded)—Carr's Membrino, sired by Membrino Patchen; dam, by Membrino Chief.

R. P. Wallace, Colusa—General, sired by old Signal; dam, by a Messenger mare.

George Belmont, Napa—General Taylor, sired by a Moss horse; dam, unknown.

William Taylor, Wisconsin—Barney, sired by Weasel; dam, unknown.

J. Sessions, Oakland—Ulster Chief, sired by Rysdiek's Hambleton; dam, Lady Ulster.

William H. Shear, San Francisco—Sir Richard, sired by Signal; dam, Lady June.

James S. McCue, San Francisco—Roe Allen, sired by Ethan Allen, Sr.; dam, a Messenger mare.

William A. Matthews, San José—George M. Patchen, Jr., sired by George M. Pachen; dam, by imported Bellfounder.

S. Eaton, Marysville—California Dexter, sired by Whipple's Hambletonian; dam, an imported mare.

Best three years old.

William Hamilton, San José—Honest Allen, sired by Ethan Allen, Jr.; dam, by Langford.

Daniel Flint, Sacramento—James Fisk, sired by Primus; dam, an Abdallah mare.

Joseph Hanlon, Georgetown—George Ellis, sired by Black Ralph; dam, unknown.

G. W. McWain, Marysville—Young Bloomsbury, sired by Bloomsbury; dam, unknown.

J. M. Culp, Colusa—General Lee, sired by Black Eagle; dam, a Signal mare.

Best two years old.

Lewis Sutton, Sacramento—Fred. Low, Jr., sired by Fred. Low; dam, a Lucy Crow mare.

James De Bose, Sacramento—Yolo, sired by Robert E. Lee; dam, a Blackhawk mare.

J. G. Griggs, Woodland—John Nelson, Jr., sired by Nelson; dam, Black Eagle mare Pet.

S. Gould, Yolo—Commodore, sired by St. Clair; dam, by Belmont.

William Hamilton, San José—Frank Malone, sired by Ethan Allen; dam, by Langford.

GELDINGS.

Best four years old and over.

Edward Hays, Buckeye, Yolo County—Jake, sired by Young Eclipse; dam, unknown.

John Munson, San Francisco—Smuggler, sired by General McClelland; dam, unknown.

J. Mundell, Mokelumne Station—Chieftain, sired by old Chieftain; dam, a Morgan mare.

William Taylor, Wisconsin—Brown Weasel, sired by Barney; dam, unknown.

George Cadwalader, Sacramento—Baroon, sired by Fred. Low; dam, Lady Belmont, by Belmont.

C. F. Jones, Marysville—Ben. Wade, sired by Bidwell's Rattler; dam, a Gray Eagle mare.

D. McVicker, Wheatland—Dan. Rice, sired by Signal; dam, a Messenger mare.

A. D. Miller, Sacramento—Brown Mac, sired by St. Clair; dam, a Blackhawk mare.

J. M. Culp, Colusa—Henry Clay, sired by Signal; dam, a Messenger mare.

S. Eaton, Marysville—Clarion, sired by Langford; dam, Mary Bell.

J. M. C. Jasper, Wheatland—Robin, sired by Signal; dam, unknown.

Exhibition.

D. R. Hunt, Freeport—Pat. Hunt, sired by Tecumseh; dam, a St. Clair mare.

MARES.

Best four years old and over.

C. Horstman, Sacramento—Jennie Miller, sired by John Nelson; dam, a Morgan mare.

L. Dietz, Woodland—May Queen, sired by Young St. Clair; dam, a Bulwer mare.

John Munson, San Francisco—Sunbeam, sired by McClellan; dam, unknown.

A. Trowbridge, Sacramento—Black Ellen, sired by David Hill; dam, an American mare.

P. Fitzgerald, Woodland—Maggie, sired by Major; dam, a Nelson mare.

J. Sessions, Oakland—Young Diamond, sired by Speculation; dam, Lost Diamond.

P. R. Beckley, Franklin—Maggie B., sired by Ashland; dam, a St. Clair mare.

P. R. Beckley, Franklin—Lady Franklin, sired by Ashland; dam, a St. Clair mare.

D. McVicker, Wheatland—Lizzie Jasper, sired by Signal; dam, a messenger mare.

W. A. Findley, Wheatland—Gypsy, sired by Signal; dam, Jane.

S. Eaton, Marysville—Ellen Bryan, sired by Signal; dam, Mary Fish.
J. M. C. Jasper, Wheatland—Lilly Calloway.

Best three years old.

John Munson, San Francisco—Patchen Queen, sired by George M. Patchen; dam, a Kimball Jackson mare.
E. Greer, Sacramento—Picayune, sired by Tecumseh; dam, Jane St. Clair, by St. Clair.
Wm. Hamilton, San José—Clara Allen, sired by Ethan Allen, Jr.; dam, St. Clair, by Owen Dale.
Wm. Hamilton, San José—Edith Allen, sired by Ethan Allen, Jr.; dam, unknown.

Best two years old.

Wm. Hamilton, San José—Fanchon, sired by Ethan Allen, Jr.; dam, Winona.
David T. Biggs, Biggs' Station—Tony, sired by General Taylor; dam, Beals' trotting mare.
Major M. Biggs, Biggs' Station—Wild Bill, sired by Taylor; dam, a Tecumseh mare.
Joseph Hanlon, Franklin—Fanny, sired by Black Ralph; dam, unknown.
Leland Stanford, Sacramento—Gilberte, sired by Fred. Low; dam, unknown.

CARRIAGE HORSES.

Best matched span carriage horses.

E. Pierce, Sacramento—Penny and John.
A. J. Scoggins, Colusa—George Washington and Stonewall Jackson.
James Clarke, Colusa—Hector and Brigham.
Wm. A. Matthews, San José—Hector and mate.
J. M. Culp, Colusa—Flora and Eva.

ROADSTER TEAMS.

Best double team roadsters.

J. G. Griggs, Woodland—Lady Nelson and Jennie.
A. A. Louderback, San Francisco—Lady Roso and Alameda Maid.
A. J. Scoggins, Colusa—Frank and Billy.
A. J. Scoggins, Colusa—Kittie and Jennie.
M. Sprague, Sacramento—Dick and Governor.
G. S. Mitchell, Sacramento—Tom and Jerry.
George Bemont, Napa—Highlander and Highland Mary.
T. Ginderey, Butte's, Sutter County—Joe Riley and Frank Morgan, sired by Signal; dam, unknown.
John Harrold, San Francisco—Billy Lyon and mate.
Wm. Bassett, Chico—Polly and Jane.
W. H. Findley, Wheatland—John and Mike.
W. B. Carr, San Francisco—Billy and mate.

SADDLE HORSES.

Best saddle horse, mare or gelding.

F. M. Shepler, Sacramento—Fred.
E. S. Lowell, Sacramento—George.
E. H. Gilbert, Sacramento—Brighton Johnnie.
A. D. Miller, Sacramento—Lady of the Lake.
J. K. Weast, Colusa—Boston.
D. T. Biggs, Biggs' Station—Tony.
M. Biggs, Biggs' Station—Wild Bill.

COLTS.

Best yearling horse colt.

D. M. Reavis, Chico—Jim Adams, sired by Blackbird; dam, a thoroughbred mare.
William Hamilton, San José—Black Allen, sired by Ethan Allen, Jr.; dam, by Belmont.
J. C. Gould, San José—Haley, sired by Whipple; dam, Liz., a Mayday mare.

Best yearling mare colt.

William Hamilton, San José—Susie, sired by Ethan Allen; dam, Santa Clara.
Adam Newbauer, Sacramento—Daisy Donner, sired by Young Washington; dam, Blackleg.
A. Trowbridge, Sacramento—Nelly, sired by St. Clair; dam, a David Hill mare.

Best sucking horse colt.

J. W. Hawkins, Solano.
W. P. A. Craig, Rye Patch, Nevada—Young Louis, sired by Louis II; dam, Diomede, a Rattler mare.
D. M. Reavis, Chico—Doc. Sproul, sired by Blackbird; dam, by Lancet.
D. M. Reavis, Chico—May Boy, sired by Blackbird; dam, by Billy McCracken.
George Hack, Sacramento—Newt., sired by Booth; dam, Nellie Grant.
Theodore Winters, Solano—B. C., sired by Norfolk; dam, Hennie Farrow.
Theodore Winters, Solano—C. C., sired by Norfolk; dam, Nevada.
Theodore Winters, Solano—S. C., sired by Norfolk; dam, Lou. Barnes.
William Hamilton, San José—Dale, sired by imported Hercules, out of Lizzie Marshall.
A. D. Miller, Sacramento—Witch Hazel, sired by Ethan Allen; dam, Santa Clara.
W. A. Findley, Wheatland—Ralph, sired by Black Ralph; dam, a Signal mare.
S. Eaton, Marysville—Mike Nye.
S. Eaton, Marysville—Sam.

Best sucking mare colt.

Carl Halverson, Patterson's Station—Queen, sired by John Bull; dam, Bell, by St. Clair.
William Hamilton, San José—Young Winona, sired by Ethan Allen; dam, Winona.
John Neal, Sacramento—Fanny, sired by Silverheels; dam, Eliza.
W. A. Findley, Wheatland—Kitty Peel.

Best exhibit of not less than six colts, owned by one person.

William Hamilton, San José—Honest Allen, Justice, Tom Scott, Frank Malone, Clara Allen, Black Allen, Boy Filly, Fanchon.

SWEEPSTAKES.

Best stallion of any age.

D. M. Reavis, Chico—Blackbird.
John Hall, Alvarado—Tom.
Theodore Winters, Solano—Norfolk.
John Boggs, Colusa—Langford.
George Treat, San Francisco—Thad. Stevens.
Jesse M. Carr, Gabilan—Carr's Membrino.

Best mare of any age.

E. Pierce, Sacramento—Lucy Moore, sired by George Moore, Jr.; dam, Nelly Morgan.
D. M. Reavis, Chico—Flora, sired by Blackbird; dam, by John Morgan.
D. M. Reavis, Chico—Nellie, sired by Blackbird; dam, a Glencoe mare.
John Hall, Alvarado—Peggy Ringgold.
A. A. Louderback, San Francisco—Alameda Maid, sired by old Hamiltonian; dam, Lady Livingston, by Bigott's Rattler.
Theodore Winters, Solano—Hennie Farrow.
Wm. Boots, San José—Miami.

JACKS.

E. A. Bridgford, Colusa—Mameluke, four years old and over.
M. Biggs, Biggs' Station—Humboldt, four years old and over, sired by imported Compromise; out of imported jennet Lydia Young.
T. A. L. Chapman, Suisun—Gray Eagle, seven years old and over.

JENNIES.

Thomas Edwards, Sacramento—Julia, four years old.
Thomas Edwards, Sacramento—Nancy, three years old.

MULES.

No entry.

DURHAM CATTLE.

BULLS.

Best three years old and over.

D. W. Reavis, Chico—Stonewall.
Jeff. Bridgford, Paris, Missouri—Muscovite.
Jeff. Bridgford, Paris, Missouri—Gold Dust.
Jeff. Bridgford, Paris, Missouri—Western Duke.
S. B. Emerson, Mountain View—Sheriff.
M. Wick, Oroville—Red Cloud.
J. B. Haggin, San Francisco—Bolingbroke.
C. Younger, San José—Thorndale.

Best three years old.

Dr. H. J. Glenn, Jacinto, Colusa County—General Grant, got by Flying Cloud, 6,793; out of Hebe 3d.
H. D. Marshall, Roseville—Marshall.
C. Younger, San José—Tempest.

Best two years old.

Jones & Co., San José—Master Maynard, 14,881.
W. P. A. Craig, Rye Patch, Nevada—Duke.
D. W. Reavis, Chico—Duke of Liberty.
M. Dale, Prairie, Yolo County—Moonlight.
M. Wick, Oroville—Orlando.
Carr & Chapman, Gabilan—Governor Booth.
E. Comstock, Yolo—First Duke of Yolo.
George W. Scott, Cottonwood, Yolo County—Ninth Duke of Liberty.

Best one year old.

Jones & Co., San José—Mason Duke, 14,875.
W. P. A. Craig, Rye Patch, Nevada—Darlington.
J. C. Conner, Sacramento—Jerry.
Jeff. Bridgford, Paris, Missouri—Cornell.
Charles Clark, San José—Duke of Manchester.
M. Sparks, Wheatland—Newton Booth.
Carr & Chapman, Gabilan—Sixth Lord of Oxford.
Carr & Chapman, Gabilan—Frank.
L. J. Orcutt, Covington, Massachusetts—Abe.
L. J. Orcutt, Covington, Massachusetts—Ben.
L. J. Orcutt, Covington, Massachusetts—Grant.
L. J. Orcutt, Covington, Massachusetts—Earl of Glenwood.
L. J. Orcutt, Covington, Massachusetts—Mazourka Valentine.
Carr & Chapman, Gabilan—Monkey John 2d.

Best bull calf.

Jones & Co., San José—New Years Gift, 17,818.
Jeff. Bridgford, Paris, Missouri—Bourbon Duke.

S. B. Emerson, Mountain View—California Andrie.
S. B. Emerson, Mountain View—Cambridge Duke.
M. Wick, Oroville—Prince Albert.
M. Wick, Oroville—Sentinel.
M. Wick, Oroville—Plowman.
M. Wick, Oroville—Lancaster.
M. Wick, Oroville—Defender.
John McIlmoil, Marysville—Stirling.
E. Comstock, Marysville—Henry Ward.
C. Younger, San José—Arthur Lemon.
C. Younger, San José—Red Thorndale.
C. Younger, San José—Oxford Lad.

COWS.

Best four years old and over.

Jones & Co., San José—Rosalind.
Jeff. Bridgford, Paris, Missouri—Jennie McLean.
Jeff. Bridgford, Paris, Missouri—Flora Hastings 4th.
Jeff. Bridgford, Paris, Missouri—Western Lady.
Jeff. Bridgford, Paris, Missouri—Rosa Lee.
S. B. Emerson, Mountain View—Cambridge 12th.
M. Wick, Oroville—Echo.
John McIlmoil, Marysville—Adelaide.
Carr & Chapman, Gabilan—Lady Solway.
Carr & Chapman, Gabilan—Christobell.
Carr & Chapman, Gabilan—Lonan 44th.
C. Younger, San José—Sprightly.
C. Younger, San José—Red Rose of Woodlawn.
L. J. Orcutt, Covington, Massachusetts—Rosaline.

Best three years old.

Jones & Co., San José—Lorena 2d.
Jones & Co., San José—Geraldine 14th.
Jeff. Bridgford, Paris, Missouri—Nelly Bly.
Jeff. Bridgford, Paris, Missouri—Ellen 3d.
Jeff. Bridgford, Paris, Missouri—Nannie 3d.
M. Wick, Oroville—Belle of Butte.
Carr & Chapman, Gabilan—Hope 22d.
C. Younger, San José—Jennie.
C. Younger, San José—Gem.

Best two years old.

Jones & Co., San José—Savannah 3d.
Jones & Co., San Jose—Caroline 5th.
Jones & Co., San José—Myra Oxford.
W. P. A. Craig, Rye Patch, Nevada—Queen.
W. P. A. Craig, Rye Patch, Nevada—Mayflower.
Jeff. Bridgford, Paris, Missouri—Cora Lee.
Jeff. Bridgford, Paris, Missouri—Lonan of Ashley.
M. Sparks, Wheatland—Elfida.

Carr & Chapman, Gabilan—Pet of Geneva.
C. Younger, San José—Valley Maid.

Best one year old.

Jones & Co., San José—Lady Hughs.
Jones & Co., San José—Anna Washington 2d.
W. P. A. Craig, Rye Patch, Nevada—Beauty.
W. P. A. Craig, Rye Patch, Nevada—Rose.
Jeff. Bridgford, Paris, Missouri—Delia Bridgford.
Jeff Bridgford, Paris, Missouri—Lady Meldon.
Charles Clark, San José—Duchess of York 13th.
Charles Clark, San José—Duchess of York 15th.
M. Wick, Oroville—Carlotta.
M. Wick, Oroville—Venus.
Jeff. Bridgford, Paris, Missouri—Essa.
John McIlmoil, Marysville—Alice (one year and eight days).
E. Comstock, Yolo—Nelsina.
E. Comstock, Yolo—Malonia.
C. Younger, San José—Forest Rose.
C. Younger, San José—Maid of Athol.
L. J. Orcutt, Covington, Massachusetts—Lucy.

Best heifer calf.

Jeff. Bridgford, Paris, Missouri—Medora.
M. Wick, Oroville—Gem.
M. Wick, Oroville—Eloina.
Carr & Chapman, Gabilan—Willful 2d.
Carr & Chapman, Gabilan—Rose 2d.
C. Younger, San José—Hester Ryan.
C. Younger, San José—Rosa Nell.

Best herd of thoroughbred cattle—bull and not less than five females.

Jones & Co., San José—Master Maynard and Rosalind 4th, Lorena 2d, Geraldine 14th, Caroline 5th, and Myra Oxford.
Jeff. Bridgford, Paris, Missouri—Muscovite and five females.
Jeff. Bridgford, Paris, Missouri—Gold Dust and five females.
M. Wick, Oroville—Orlando and five females.
Carr & Chapman, Gabilan—Governor Booth and five females.
J. B. Haggin, San Francisco—Dashwood and five females.
C. Younger, San José—Tempest and five females.

DEVON CATTLE.

BULLS.

Best three years old.

Seneca Daniels, Lakeville—Duke.

Best bull calf.

Seneca Daniels, Lakeville—Beecher.
Seneca Daniels, Lakeville—Tilton.

COWS.

Best four years old and over.

Seneca Daniels, Lakeville—Fanny.
Seneca Daniels, Lakeville—Fashion.
Seneca Daniels, Lakeville—Fairy.
Seneca Daniels, Lakeville—Victoria.

Best two years old.

Seneca Daniels, Lakeville—Fancy.

JERSEY CATTLE.

BULLS.

Best four years old and over.

J. B. Haggin, San Francisco—Dashwood.

Best two years old.

A. Mailliard, San Rafael—Keystone.

Best one year old.

J. B. Haggin, San Francisco—Billy Dashwood.
J. B. Haggin, San Francisco—Damon.
L. C. Powers, Sacramento—Volunteer.

Best bull calf.

A. Mailliard, San Rafael—Florian, five months
J. B. Haggin, San Francisco—Hero.
J. B. Haggin, San Francisco—Joice.

COWS.

Best four years old and over.

J. B. Haggin, San Francisco—Victoria.
L. C. Powers, Sacramento—Daisy Eyebright.
L. J. Orcutt, Covington, Massachusetts—Blanche.

Best three years old.

J. B. Haggin, San Francisco—Nelly Bly.
J. B. Haggin, San Francisco—Maria.
J. B. Haggin, San Francisco—Fanchette, imported.

Best two years old.

A. Mailliard, San Rafael—Floradell 2d.
J. B. Haggin, San Francisco—Lily Hudson.
J. B. Haggin, San Francisco—School Girl.
J. B. Haggin, San Francisco—Inez 2d.
J. B. Haggin, San Francisco—Music.
J. B. Haggin, San Francisco—Tom's Daughter.
J. B. Haggin, San Francisco—Miss Dame.
J. B. Haggin, San Francisco—Stella Light.
L. C. Powers, Sacramento—Creampot 5th.
L. C. Powers, Sacramento—Hazel of Staatsburgh.
L. J. Orcutt, Covington, Massachusetts.

Best one year old.

A. Maillard, San Rafael—Bloomer 3d.
J. B. Haggin, San Francisco—Mela 2d.
J. B. Haggin, San Francisco—Mabella.
L. C. Powers, Sacramento—Magna 4th.
L. C. Powers, Sacramento—Minnie 4th.
L. C. Powers, Sacramento—Lalla Rookh.
L. C. Powers, Sacramento—Hannah.
L. C. Powers, Sacramento—Daffodil.
L. C. Powers, Sacramento—Rose 5th.
L. C. Powers, Sacramento—Cherry.
L. C. Powers, Sacramento—Irene.
L. C. Powers, Sacramento—Estella.
L. C. Powers, Sacramento—Zephrine 5th.
L. J. Orcutt, Covington, Massachusetts—Floss.
L. J. Orcutt, Covington, Massachusetts—Jessie.
L. J. Orcutt, Covington, Massachusetts—Primrose.
L. J. Orcutt, Covington, Massachusetts—Ruby.

CALVES.

Best heifer calf.

A. Mailliard, San Rafael—Mollie 2d, four months.
A. Mailliard, San Rafael—Lady Jane 3d.
S. B. Haggin, San Francisco—Inez 3d.
A. Mailliard, San Rafael—Guernsey bull Captain, two years.

ALDERNEY CATTLE.

BULLS.

Best four years old and over.

Robert Beck, Sacramento—Touchstone.
L. C. Powers, Sacramento—Saratoga.

Best one year old.

W. J. Prather, Woodland—Bismarck.

Best bull calf.

A. Mailliard, San Rafael—Young Comet.
A. Mailliard, San Rafael—Jimmy.

COWS.

Best four years old and over.

A. Mailliard, San Rafael—Cora.

Best three years old.

A. Mailliard, San Rafael—Annie.

Best two years old.

A. Mailliard, San Rafael—Romana.

Best one year old.

A. Mailliard, San Rafael—Lady Rowen 4th.

CALVES.

Best heifer calf.

A. Mailliard, San Rafael—Romona 2d.

AYRSHIRE CATTLE.

BULLS.

Best two years old.

Robert Beck, Sacramento—Lord Clyde.

Best one year old.

Robert Beck, Sacramento—Major Wentworth.
Robert Beck, Sacramento—Melaneton Callaghan.

COWS.

Best four years old and over.

Robert Beck, Sacramento—Kitty Clyde.
L. A. Upson, Sacramento—Flora McIvor.

Best one year old.

L. A. Upson, Sacramento—Bonnie Jean.

HOLSTEIN CATTLE.

Best bull four years old and over.

S. B. Emerson, Mountain View—Opides.

GRADED CATTLE.

BULLS.

Best three years old.

Charles Green, Rio Vista—Duke.
C. P. Hensley, Rio Vista—Major.

Best two years old.

F. Babel, Sacramento—Jack, one thousand eight hundred and ten pounds.
Charles Green, Rio Vista—General Sherman.
E. Comstock, Yolo—Granger.

Best one year old.

John McIlmoil, Marysville—Bismarck.
E. Comstock, Yolo—Billy.
H. Hamel, Davisville, Solano County—Grenadier.
H. Hamel, Davisville, Solano County—Bolingbroke.

Best bull calf.

E. Comstock, Yolo—Mike.
E. Comstock, Yolo—Laddie.

COWS.

Best four years old and over.

F. Babel, Sacramento—Hannah, two thousand one hundred pounds.
P. Yager, Folsom—Bally, one thousand six hundred and thirty pounds.
E. Comstock, Yolo—Chub.

Best three years old.

Charles Clarke, San José—Mollie.
Charles Green, Rio Vista—Dolly Varden.
E. Comstock, Yolo—Spark.

Best two years old.

E. Comstock, Yolo—Blanche.
Charles Green, Rio Vista—Dolly Varden.

Best one year old.

S. B. Emerson, Mountain View—Fairy Queen.
S. B. Emerson, Mountain View—Princess.
E. Comstock, Yolo—May Queen.

Best heifer calf.

P. Yager, Folsom—Rosa, six hundred and eighty-one pounds.
Charles Clarke, San José—Mollie 1st.
C. P. Hensley, Rio Vista—Dora.
E. Comstock, Yolo—Lady Tilton.

Best milch cow.

Peter Burns, Sacramento—Maria.
E. Comstock, Yolo—Red.

Best cow for having calves.

Thomas J. Clunie, Sacramento—Old Prolif. and calves. (Had three the third of November, eighteen hundred and seventy-three.)

SWEEPSTAKES.

Best bull of any age or breed.

Jones & Co., San José—Master Maynard.
Jones & Co., San José—Mason Duke.
D. M. Reavis, Chico—Stonewall.
D. M. Reavis, Chico—Duke of Liberty.
Jeff. Bridgford, Paris, Missouri—Muscovite.
Jeff. Bridgford, Paris, Missouri—Gold Dust.
S. B. Emerson, Mountain View—Sheriff.
Carr & Chapman, Gabilan—Governor Booth.
C. Younger, San José—No entry.
Milton Dale, Prairie, Yolo County—Moonlight.
H. J. Glenn, Jacinto—General Grant.

Best cow of any age or breed.

Jones & Co., San José—Loreno 2d.
Jones & Co., San José—Geraldine 14th.
P. Yager, Folsom—Bally.
Jeff. Bridgford, Paris, Missouri—Jennie McLean.
Jeff. Bridgford, Paris, Missouri—Flora Hastings 4th, or Cora Lee.
Carr & Chapman, Gabilan—Lady Solway.
C. Younger, San José—Sprightly.

Best bull and five of his calves, under one year old.

M. Wick, Oroville—Red Cloud and five calves, Sentinel, Plowman, Lancaster, Defender, and Elvina.

C. Younger, San José—Thorndale and five calves, Duke of Forest Home, 2d Duke of Forest Home, Red Thorndale, Hester Ryan, and Rose Hill.

SHEEP.

SPANISH MERINO.

Best ram two years old and over.

Severance & Peet, Niles Station—Big Leg.
Severance & Peet, Niles Station—Green Mountain.
Severance & Peet, Niles Station—California Chief.
J. C. Conner, Sacramento—Madrid.
G. H. Barney, Woodland—Bret Harte.

Best ram over one year old and under two.

Severance & Peet, Niles Station—Seville.
Fred. Cox, Sacramento—Long Wool.

Hammond & Co., Orwell, Vermont—One buck; no name.
Hammond & Co., Orwell, Vermont—One buck; no name.

Best three ram lambs.

Severance & Peet, Niles Station—Three ram lambs.
Severance & Peet, Niles Station—Three ram lambs.
J. C. Conner, Sacramento—Three ram lambs.
Fred. Cox, Sacramento—Three ram lambs.
S. Treat, Sacramento—Three ram lambs.

Best five ewes two years old and over.

Murray & Watt, Sacramento—Pen of five ewes.
Severance & Peet, Niles Station—Pen of five ewes.
Severance & Peet, Niles Station—Pen of five ewes.
J. C. Conner, Sacramento—Pen of five ewes.
Fred. Cox, Sacramento—Pen of five ewes.

Best five ewes over one year old and under two.

Murray & Watt, Sacramento—Pen of five ewes.
Severance & Peet, Niles Station—Pen of five ewes.
Severance & Peet, Niles Station—Pen of five ewes.
Fred. Cox, Sacramento—Pen of five ewes.
Hammond & Co., Orwell, Vermont—Pen of five ewes.

Best five ewe lambs.

Severance & Peet, Niles Station—Five ewe lambs.
Severance & Peet, Niles Station—Five ewe lambs.
J. C. Conner, Sacramento—Five ewe lambs.
Fred. Cox, Sacramento—Five ewe lambs.
S. Treat, Sacramento—Five ewe lambs.

Best ram and five of his lambs.

Severance & Peet, Niles Station—Big Leg and five lambs.

FRENCH MERINO.

Best ram two years old and over.

William Blacow, Centreville, Alameda County—Gamester.
Robert A. Brampton, Dixon—Napoleon.

Best ram over one year old and under two.

William Blacow, Centreville, Alameda County—Sultan.
R. A. Brampton, Dixon—Rufus.

Best three ram lambs.

Murray & Watt, Sacramento—Pen of three lambs.
William Blacow, Centreville, Alameda County—Pen of three lambs.
Murray & Watt, Sacramento—Pen of three lambs.

Best five ewes two years old and over.

William Blacow, Centreville, Alameda County—Pen of five.
R. A. Brampton, Dixon—Pen of five.

Best five ewe lambs over one year old and under two.

William Blacow, Centerville, Alameda County—Pen of five lambs.

Best five ewe lambs.

Murray & Watt, Sacramento—Pen of five lambs.
William Blacow, Centreville, Alameda County—Pen of five lambs.

Best ram and five of his lambs.

William Blacow, Centreville, Alameda County—Gamester and five lambs.

SILESIAN.

Best ram two years old and over.

Robert Beck, Sacramento—Pen of five.
Robert Beck, Sacramento—Pen of three.
S. Treat, Sacramento—Longfellow.
Murray & Watt, Sacramento—Damifino.
L. J. Orcutt, Covington, Massachusetts—Pen of three.

Best ram one year old.

S. Treat, Sacramento—Youngfellow.

Best pen of five ewes, one year old and under two.

S. Treat, Sacramento—Pen of five ewes.

COTSWOLD.

Best ram two years old and over.

S. B. Emerson, Mountain View—Link.

Best ram one year old and under two.

Landrum & Rogers, Watsonville—Prince, Jr.

Best three lamb rams.

Landrum & Rogers, Watsonville—Pen of three.

Best five ewes, two years old and over.

Landrum and Rogers, Watsonville—Pen of five ewes.
S. B. Emerson, Mountain View—Pen of five ewes.

Best pen of five ewe lambs.

S. B. Emerson, Mountain View—Pen of five.

Best ram and five of his lambs.

S. B. Emerson, Mountain View—Link and five lamb

SHROPSHIRE.

Two years old and over.

Lewis Pierce, Suisun—Jack.
Lewis Pierce, Suisun—Pen of five ewes.
Lewis Pierce, Suisun—Jack and five of his lambs.

LEICESTERSHIRE.

Best ram two years old and over.

J. D. Carr, Gabilan—Lord Leicester.

SOUTHDOWN.

Best ram two years old and over.

George Bemont, Napa—One ram.

Best ram one year old.

George Bemont, Napa—One ram.

Best three lamb rams.

George Bemont, Napa—Three lamb rams.

Best pen of five ewes, two years old and ov

George Bemont, Napa—Pen of five ewes.

Best pen of five ewes, under two years.

George Bemont, Napa—Pen of five ewes.

SOUTHDOWN.

Best five ewe lambs.

George Bemont, Napa—Pen of five ewe lambs.

Best ram and five lambs.

George Bemont, Napa—Ram and five lambs.
J. D. Carr, Gabilan—Ram Fordham, two years old and over.

J. D. Carr, Gabilan—Ram Fordham and five lambs.
J. D. Carr, Gabilan—Three ram lambs.
J. D. Carr, Gabilan—Five ewes, two years and over.
J. D. Carr, Gabilan—Five ewe lambs.

GRADED.

Best ram two years old and over.

J. H. Glide, Sacramento—Good Fleece.

Best ram over one year old and under two.

G. W. Hancock, Sacramento—Whitney.
L. Pierce, Suisun—Solano.
J. H. Glide, Sacramento—Button.
J. H. Glide, Sacramento—Improvement.
S. Treat, Sacramento—Youngfellow.

Best five ram lambs.

R. A. Brampton, Dixon—Pen of five.

Best five ewes two years old and over.

R. A. Brampton, Dixon—Pen of five.
S. B. Emerson, Mountain View—Pen of five.

Best five ewes over one year old and under two.

R. A. Brampton, Dixon—Pen of five.
G. W. Hancock, Sacramento—Pen of five.

Best pen of five ewe lambs.

R. A. Brampton, Dixon—Pen of five.
G. W. Hancock, Sacramento—Pen of five.
L. Pierce, Suisun—Pen of five.

SWEEPSTAKES.

Best ram, of any age or breed, and five of his lambs.

William Blacow, Centreville, Alameda County—Gamester and five lambs.
Severance & Peet, Niles Station—Big Leg and five lambs.
L. Pierce, Suisun—Jack and five lambs.

GOATS.

THOROUGHBRED.

Best buck two years old and over.

N. Gilmore, El Dorado—Hannibal.
Robert Beck, Sacramento—Pen of five.
Landrum & Rogers, Watsonville—Tommy.
C. P. Bailey, San José—Don Juan.
J. P. Sargent, Gilroy—Persian.
J. P. Sargent, Gilroy—Aladdin.

Best buck under two years.

N. Gilmore, El Dorado—Aladan.
Landrum & Rogers, Watsonville—Hercules 87.
E. P. Wetzel, Sacramento—Billy and Billie.

Best pen of three does two years old and over.

N. Gilmore, El Dorado—Pen of three does.
Landrum & Rogers, Watsonville—Pen of three does.
C. P. Bailey, San José—Pen of three does.
E. P. Wetzel, Sacramento—Pen of three does.

Best pen of three does under two years.

N. Gilmore, El Dorado—Pen of three does.
Landrum & Rogers, Watsonville—Pen of three does.

GRADED.

Best pen of does two years old and over.

A. P. Sargent, Gilroy—Pen of three does.

SWEEPSTAKES.

Best buck.

N. Gilmore, El Dorado—Hannibal.
Landrum & Rogers, Watsonville—Hercules 87.

Best does.

N. Gilmore, El Dorado—Cleopatra.
Landrum & Rogers, Watsonville—Annie.

Best pen of not less than ten kids.

Landrum & Rogers, Watsonville—Pen of ten kids.
A. P. Sargent, Gilroy—Pen of ten kids.

SWINE.

Best boar two years old and over.

R. S. Thompson, Napa—Young Comet.
E. J. Sparks, Lincoln—Dick, Berkshire.
A. T. Hatch, Suisun—Brigham, Poland and China.
E. F. Aiken, Sacramento—Dick.
George O. Bates, Elk Grove—Bill Hamilton.

Best boar under two years old.

W. P. A. Craig, Rye Patch, Nevada—Sucker Boy.
R. S. Thompson, Napa—Some Genteel.
Peter Burns, Sacramento—Dick.
Jos. Blake, Suisun—Longfellow, Poland and China.
E. A. Bridgford, Colusa—Dick, Berkshire.
Charles Green, Rio Vista—George.
J. C. Mills, Centreville—Wallington, Jr.

Best boar six months and under one year.

R. S. Thompson, Napa—Washoe.
R. S. Thompson, Napa—112.
Peter Burns, Sacramento—Jim.
A. T. Hatch, Suisun—Billy.
A. T. Hatch, Suisun—Bob.
Charles Clarke, San José—John.
Adam Newbauer, Sacramento—Sam.
E. Comstock, Yolo—Jake and party.

Best breeding sow two years old and over.

R. S. Thompson, Napa—America.
R. S. Thompson, Napa—Beauty.
E. J. Sparks, Lincoln—Susan.
J. C. Mills, Centreville—Victoria, improved Berkshire.
J. C. Mills, Centreville—Princess, improved Berkshire.
Charles Green, Rio Vista—Mary, Essex.
E. Comstock, Yolo—Berk.

Best breeding sow one year old.

W. P. A. Craig, Rye Patch, Nevada—Molly, Sally, and Granny.
R. S. Thompson, Napa—Victoria 4th.
R. S. Thompson, Napa—Belle 2d.
E. A. Bridgford, Colusa—Kitty Thompson.
E. A. Bridgford, Colusa—Nannie Baker.
Charles Green, Rio Vista—Roller.
Adam Newbauer, Sacramento—Hecuba.

Best sow six months old and under one year.

R. S. Thompson, Napa—Berkshire Beauty.
Peter Burns, Sacramento—Dolly.
Jos. Blake, Suisun—Bonita.
Charles Clarke, San José—Sally.
E. Comstock, Yolo—Betty.

Best pair pigs from six to ten months old.

R. S. Thompson, Napa—Pen of pigs, Comet 3d, No. 110.
E. J. Sparks, Lincoln—Pair of Berkshire pigs.
Charles Clarke, San José—Jacob and Nancy Ann.
E. A. Bridgford, Colusa—Pair of pigs.
Charles Green, Rio Vista—Pair of pigs.
E. Comstock, Yolo—Pair of pigs.

Best pen of ten pigs of any age or breed belonging to one owner.

W. P. A. Craig, Rye Patch, Nevada—Pen of ten pigs.
E. J. Sparks, Lincoln—Pen of ten pigs.
E. A. Bridgford, Colusa—Pen of ten pigs.
J. C. Mills, Centreville—Pen of ten pigs.
Adam Newbauer, Sacramento—Pen of ten pigs.
E. Comstock, Yolo—Pen of ten pigs.
E. Comstock, Yolo—Pen of ten pigs.

SWEEPSTAKES.

Best boar of any age or breed.

R. S. Thompson, Napa—Young Comet.
E. J. Sparks, Lincoln—Dick.
A. T. Hatch, Suisun—Brigham.
A. T. Hatch, Suisun—Billy.
Jos. Blake, Suisun—Longfellow.
E. A. Bridgford, Colusa—Berkshire Boy, four months old.
J. C. Mills, Centreville—Wellington.
W. P. A. Craig, Rye Patch, Nevada—Sucker Boy.
Geo. O. Bates, Sacramento—Bill Hamilton.

POULTRY.

R. Cowne, Sacramento—One lot Dominiques.
R. Cowne, Sacramento—One lot Jersey Blues.
R. Cowne, Sacramento—One lot Bremen geese.
R. Cowne, Sacramento—One lot English geese.
P. H. Fisher, Sacramento—One lot Buff ducks.
R. Cowne, Sacramento—One lot Silver Pencils.
F. S. George, Sacramento—One lot Spanish Thoroughbreds.

SWEEPSTAKES.

J. B. White, Sacramento—Golden Spangled Hamburgs.
Jerome Davis, Sacramento—Silver Spangled Hamburgs.
M. Butler, Sacramento—White Leghorns.
Bassett & Miller, Sacramento—Light Bramahs.
Bassett & Miller, Sacramento—Silver Duckwing Game Bantams.
W. J. Prather, Woodland—One lot Golden Seabright Bantams.
W. J. Prather, Woodland—One lot Muscovite ducks.
W. J. Prather, Woodland—One lot White Leghorn fowls.
W. J. Prather, Woodland—One lot Silver Spangled Hamburgs.
Jones & Co., San José—One lot Buff Cochins.
Jones & Co., San José—One lot Dark Bramahs.
C. H. Theiss, Sacramento—One lot Black Javas.
C. H. Theiss, Sacramento—One lot Java chicks.
C. H. Theiss, Sacramento—One lot Buff Cochin chicks.
C. H. Theiss, Sacramento—One lot White Leghorn chicks.
Peter Burns, Sacramento—One lot Light Bramahs.
Peter Burns, Sacramento—One lot Black Bramahs.
Peter Burns, Sacramento—One lot Black Polands.
Peter Burns, Sacramento—One lot Royal Cochins.
Peter Burns, Sacramento—One lot Malays.
Peter Burns, Sacramento—One lot White Dorkins.
Peter Burns, Sacramento—One lot best distinct variety.
Peter Burns, Sacramento—One lot English Magpie Topknot ducks.
Peter Burns, Sacramento—One lot Rouen ducks.
Peter Burns, Sacramento—One lot Asiatic chicks.
P. H. Fisher, Brighton—One lot Bronze turkeys.
P. H. Fisher, Brighton—One lot gray geese.
P. H. Fisher, Brighton—One lot Gray Mallard ducks.
A. T. Hatch, Suisun—One lot Buff Cochin chicks.
Michael Butler, Sacramento—One lot White Leghorn chicks.
Michael Butler, Sacramento—One lot Buff Cochin chicks.
J. C. Mills, Centreville—One pair Narragansett turkeys.
J. B. White, Sacramento—One lot Buff Cochins.
J. B. White, Sacramento—One lot Golden Spangled Hamburgs.
J. B. White, Sacramento—One lot Light Bramahs.
J. B. White, Sacramento—One lot Light Bramah chicks.
J. B. White, Sacramento—One pair Golden Spangled Hamburg chicks.
Jerome Davis, Sacramento—Five lots Silver Spangled Hamburgs.
F. S. George, Sacramento—One lot Spanish Thoroughbreds.
Michael Butler, Sacramento—One lot White Leghorn chicks.
A. Greer, Sacramento—One lot any other distinct variety.
Bassett & Miller, Sacramento—One lot Light Bramahs.
Bassett & Miller, Sacramento—One lot Light Bramah chicks.
Bassett & Miller, Sacramento—One lot Light Bramah chicks.
Bassett & Miller, Sacramento—One lot Dark Bramahs.
Bassett & Miller, Sacramento—One lot Silver Spangled Hamburgs.
Bassett & Miller, Sacramento—One lot White Leghorns.
Bassett & Miller, Sacramento—One lot White Leghorn chicks.
Bassett & Miller, Sacramento—One lot Black Red Games.
Bassett & Miller, Sacramento—One lot Duckwing Game Bantams.
Bassett & Miller, Sacramento—One lot Black Red Game Bantams.
Bassett & Miller, Sacramento—One lot Rouen ducks.

A. B. Gilbert—One lot Cochin chicks, five months old.
A. B. Gilbert—One lot domestic ducks.
A. B. Gilbert—One lot gray geese, six months old.
John Herring, Sacramento—One lot Dark Bramahs.
John Herring, Sacramento—One lot Dark Bramah chicks.
John Smith—One lot Leghorn fowls.
J. F. Friggins, Woodland—One lot Light Bramahs.
J. F. Friggins, Woodland—One lot Houdans.
J. F. Friggins, Woodland—One lot Houdan chicks.
J. F. Friggins, Woodland—One lot Buff Cochins.
J. F. Friggins, Woodland—One lot Buff chickens.
J. F. Friggins, Woodland—One lot White Leghorn chicks.
W. J. Prather, Woodland—One lot Dark Bramahs.
W. J. Prather, Woodland—Three lots Light Bramahs.
W. J. Prather, Woodland—Three lots Buff Cochins.
W. J. Prather, Woodland—One lot White Cochins.
W. J. Prather, Woodland—One lot Black Cochins.
W. J. Prather, Woodland—One lot Partridge Cochins.
W. J. Prather, Woodland—One lot Houdans.
W. J. Prather, Woodland—One lot White Polands.
W. J. Prather, Woodland—One lot Bearded Golden Polands.
W. J. Prather, Woodland—Two lots Golden Seabright Bantams.
W. J. Prather, Woodland—One lot Bronze turkeys.
W. J. Prather, Woodland—One lot Rouen ducks.
W. J. Prather, Woodland—One lot Black Cayuga ducks.
W. J. Prather, Woodland—One lot gray ducks.

ARTICLES EXHIBITED AT THE PARK.

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SECOND DEPARTMENT.

CLASS I—MACHINERY, IMPLEMENTS, ETC.

Exhibitor.	Post Office.	Article.
Baker & Hamilton	Sacramento	Two Ames' portable thrashing machine engines.
Baker & Hamilton	Sacramento	One Baxter steam engine.
Baker & Hamilton	Sacramento	One case (twelve) Fisher's patent section grinders.
M. C. Hawley & Co	Sacramento	Display of general machinery.
M. C. Hawley & Co	Sacramento	Thrashing engine, Garr, Scott & Co's.
Treadwell & Co	San Francisco	One Hoadley engine.
Treadwell & Co	San Francisco	One New York safety engine.
George R. Grant	Roseville, Placer County	One Great American fire extinguisher.
George R. Grant	Roseville, Placer County	Two small American fire extinguishers.

CLASS II.

Exhibitor.	Post Office.	Article.
Baker & Hamilton	Sacramento	Two Pitt's Buffalo thrashing machines.
Baker & Hamilton	Sacramento	Two cider mills and presses.
Baker & Hamilton	Sacramento	One lock-lever hay and grain rake.
Baker & Hamilton	Sacramento	Four hay and straw cutters.
Baker & Hamilton	Sacramento	Two corn shellers.
Baker & Hamilton	Sacramento	Two lawn mowers.
Baker & Hamilton	Sacramento	One lawn sprinkler.
Baker & Hamilton	Sacramento	One Champion post-hole auger.
Sweepstakes Plow Co., Baker & Hamilton, Agents.	Sacramento	Best display of agricultural machines (California manufacture).
Byron Jackson	Woodland	One self-feeder.
Byron Jackson	Woodland	One elevator.

CLASS II—Continued.

Exhibitor.	Post Office.	Article.
Byron Jackson	Woodland	One derrick and horse forks.
Keller & Co	Sacramento	One cider press (American).
Keller & Co	Sacramento	Four cutting boxes (Continental).
Keller & Co	Sacramento	One sulky rake (Ashland).
Keller & Co	Sacramento	One Down rake.
Keller & Co	Sacramento	One circular sawmill.
M. C. Hawley & Co	Sacramento	Display of agricultural machinery.
M. C. Hawley & Co	Sacramento	Thrashing machine (Gold Medal), Garr, Scott & Pitt.
M. C. Hawley & Co	Sacramento	One improved Buckeye cider mill and press.
M. C. Hawley & Co	Sacramento	One improved family cider mill and press.
M. C. Hawley & Co	Sacramento	One improved Hutchings cider mill and press.
M. C. Hawley & Co	Sacramento	One Taylor horse hay rake.
M. C. Hawley & Co	Sacramento	One Barnes horse hay rake.
M. C. Hawley & Co	Sacramento	One No. 6 Burdick hay and straw cutter.
M. C. Hawley & Co	Sacramento	One No. 3 Burdick hay and straw cutter.
M. C. Hawley & Co	Sacramento	One No. 1 Burdick hay and straw cutter.
M. C. Hawley & Co	Sacramento	One Barton hand corn sheller.
M. C. Hawley & Co	Sacramento	One Jr. Philadelphia lawn mower.
M. C. Hawley & Co	Sacramento	One five-inch post-hole auger (Orchard's).
M. C. Hawley & Co	Sacramento	One six-inch post-hole auger (Orchard's).
M. C. Hawley & Co	Sacramento	One five-inch well auger (Orchard's).
Treadwell & Co	San Francisco	One Russell end shake thrashing machine.
Treadwell & Co	San Francisco	One Paddock sulky rake.
Laufkotter Bros	Sacramento	Sweep horse-power.

CLASS III.

Exhibitor.	Post Office.	Article.
J. J. Scott	Roseville, Placer County	One harrow (flexible).
E. E. Ames	Sacramento	One chisel cultivator.
Linforth, Kellogg & Co., Ames, Agent	Sacramento	One California harrow.
Linforth, Kellogg & Co., Ames, Agent	Sacramento	One Freedman harrow.
Linforth, Kellogg & Co., Ames, Agent	Sacramento	One Woods' mowing machine.
Linforth, Kellogg & Co., Ames, Agent	Sacramento	One Woods' reaper.
Linforth, Kellogg & Co., Ames, Agent	Sacramento	One Russell reaping machine (combined reaper and mower).
M. W. Coon	Woodland	One model (improvement on header).
Baker & Hamilton	Sacramento	One Statesman grain drill.
Baker & Hamilton	Sacramento	One Harris' header.
Baker & Hamilton	Sacramento	One Buckeye self-rake and reaping machine, and mower and reaper combined.
Baker & Hamilton	Sacramento	One Buckeye harvester and mower.
Baker & Hamilton	Sacramento	One Buckeye new model mower.
Baker & Hamilton	Sacramento	Display of mowing and reaping knives and sickles.

CLASS III—Continued.

Exhibitor.	Post Office.	Article.
Baker & Hamilton	Sacramento	One one-horse cultivator.
Baker & Hamilton	Sacramento	One iron arm-horse hoe.
Baker & Hamilton	Sacramento	One double shovel plow.
Baker & Hamilton	Sacramento	One patent walking corn cultivator.
G. B. Nixon	Woodland	One seed drill.
William Gutenberger	Sacramento	One field roller and crusher—"Farmer's Friend."
Sweepstakes Plow Company, Baker & Hamilton, Agents	Sacramento	One header (California manufacture).
Baker & Hamilton	Sacramento	Two Gem broadcast seed sowers.
Baker & Hamilton	Sacramento	Ten Sweepstakes harrows.
Baker & Hamilton	Sacramento	One Sweepstakes Granger cultivator.
Baker & Hamilton	Sacramento	One wrought iron standard cultivator (all California manufacture).
Keller & Co	Sacramento	One Keystone mowing machine.
Keller & Co	Sacramento	One Excelsior mowing machine.
Keller & Co	Sacramento	One Climax mowing machine.
Keller & Co	Sacramento	One Gorham broadcast seeder and cultivator combined.
Keller & Co	Sacramento	One chisel-tooth cultivator.
Keller & Co	Sacramento	One garden cultivator.
Keller & Co	Sacramento	One horse hoe.
Keller & Co	Sacramento	One California harrow.
Keller & Co	Sacramento	One double shovel plow.
Keller & Co	Sacramento	One combined mower and dropper.
M. C. Hawley & Co	Sacramento	One Harris header.
M. C. Hawley & Co	Sacramento	One two-horse Buckeye grain drill.
M. C. Hawley & Co	Sacramento	One Cahoon's broadcast sowing machine (power).
M. C. Hawley & Co	Sacramento	One Cahoon's broadcast sowing machine (hand).
M. C. Hawley & Co	Sacramento	One W. A. Woods' mowing machine.
M. C. Hawley & Co	Sacramento	One Keystone corn planter (horse).
M. C. Hawley & Co	Sacramento	One chisel cultivator.
M. C. Hawley & Co	Sacramento	One Friedman harrow.
M. C. Hawley & Co	Sacramento	One California harrow.
M. C. Hawley & Co	Sacramento	One one-hundred-tooth harrow.
Treadwell & Co	San Francisco	One iron wheel single gear Haines' header.
Treadwell & Co	San Francisco	One Ætna mower.
Treadwell & Co	San Francisco	One clod crusher.
Matteson & Williamson	Stockton	One chisel cultivator (California manufacture).
Matteson & Williamson	Stockton	One header, Stockton Chief (California manufacture).
D. T. Gillis	Stockton	Two adjustable harrows (California manufacture).
H. N. Dallon	Pacheco	One rotating harrow, "patented" (California manufacture).
George R. Grant	Roseville	One Patron's harrow (California manufacture).
George R. Grant	Roseville	One riding cultivator (California manufacture).

CLASS IV.

Exhibitor.	Post Office.	Article.
Althouse, Wheeler & Co., E. Van Wu, Agent	Waupun, Wis.	One windwill, Granger, patented by Althouse & Raymond.
C. P. Hoag	Oakland Point	One Hoag's self-regulating windmill (California invention).
Baker & Hamilton	Sacramento	One California feed mill.
Baker & Hamilton	Sacramento	One French burr stone farm mill.
J. B. King	Sacramento	One separator and fanning mill (California manufacture).
Keller & Co	Sacramento	One fanning mill—"Pacific."
Nash, Miller & Co	Sacramento	Three separators and fanning mills (California manufacture).
A. L. Hart & Co	Sacramento	Portable field fence.
A. L. Hart & Co	Sacramento	Farm gate.
M. C. Hawley & Co	Sacramento	One Challenge farm feed mill.
M. C. Hawley & Co	Sacramento	One Challenge hand feed mill.
W. C. Nelson	Sacramento	One Hurricane Proof windmill.
W. C. Nelson	Sacramento	One Iron King windmill.
H. Stone	Dixon	One windmill, Holloday's patent.
H. Stone	Dixon	One deep well pump.

CLASS V.

Exhibitor.	Post Office.	Article.
Baker & Hamilton	Sacramento	Display of harvesting and farming tools.
Sweepstakes Plow Company, Baker & Hamilton, Agents	Sacramento	Sweepstakes road scraper (California manufacture).
Matteson & Williamson	Stockton	One horse fork for hay or grain.
Keller & Co	Sacramento	One hay loader (Foust's).
Keller & Co	Sacramento	Two barley forks (Excelsior).
Keller & Co	Sacramento	One road scraper (Bailey's, California).
Keller & Co	Sacramento	One washing machine (Humboldt).
Keller & Co	Sacramento	One hay press (Eagle Improved).
M. C. Hawley & Co	Sacramento	One box churn.
M. C. Hawley & Co	Sacramento	One No. 4 thermometer churn.
M. C. Hawley & Co	Sacramento	One No. 4 cylinder churn.
M. C. Hawley & Co	Sacramento	One garden wheelbarrow.
M. C. Hawley & Co	Sacramento	One canal wheelbarrow.
M. C. Hawley & Co	Sacramento	One Enterprise coffee and spice mill.
M. C. Hawley & Co	Sacramento	One double harpoon fork.
M. C. Hawley & Co	Sacramento	One single harpoon fork.
M. C. Hawley & Co	Sacramento	One Keystone portable forge.
A. P. Smith	Sacramento	Two long ladders, patented.
A. P. Smith	Sacramento	One step ladder, patented.
Laufkotter Brothers	Sacramento	One deep well pump.
Laufkotter Brothers	Sacramento	One force pump.
Mrs. M. J. Clark	Nelson Station, Butte County	New process for saving cream and making butter.

CLASS VI.

Exhibitor.	Post Office.	Article.
Linforth, Kellogg & Co., Ames, agent	San Francisco	One single Garden City clipper plow, No. 63.
Linforth, Kellogg & Co., Ames, agent	San Francisco	One single Garden City clipper plow, No. 53.
Linforth, Kellogg & Co., Ames, agent	San Francisco	One single Garden City clipper plow, No. 31.
Linforth, Kellogg & Co., Ames, agent	San Francisco	One single Garden City clipper plow, No. 40.
Linforth, Kellogg & Co., Ames, agent	San Francisco	One single Garden City clipper plow, No. 26.
Linforth, Kellogg & Co., Ames, agent	San Francisco	One Napa gang plow.
Baker & Hamilton	Sacramento	Two No. 6 Moline stubble plows.
Baker & Hamilton	Sacramento	Two No. 7 Moline stubble plows.
Baker & Hamilton	Sacramento	One C. 7 Moline turf or sod plow.
Baker & Hamilton	Sacramento	Two one-horse steel plows.
Baker & Hamilton	Sacramento	Three steel plows.
Baker & Hamilton	Sacramento	One No. 6 Monitor cast-iron plow.
Baker & Hamilton	Sacramento	One sidehill plow.
Sweepstakes Plow Company, Baker & Hamilton, agents	Sacramento	Fifteen Eureka and Sweepstakes California gang plows.
Wm. Kendall	Sacramento	One two-horse Granger plow.
Keller & Co	Sacramento	One gang plow (Myers', Marysville).
Keller & Co	Sacramento	Five John Deere Moline single plows.
M. C. Hawley & Co	Sacramento	One John Deere gang plow.
M. C. Hawley & Co	Sacramento	One John Deere stubble plow.
M. C. Hawley & Co	Sacramento	One John Deere sod plow.
M. C. Hawley & Co	Sacramento	Steel plow.
M. C. Hawley & Co	Sacramento	One-horse plow.
M. C. Hawley & Co	Sacramento	Sidehill plow.
M. C. Hawley & Co	Sacramento	Subsoil plow.
Treadwell & Co	San Francisco	Treadwell sulky gang plow.
Treadwell & Co	San Francisco	One Victor gang plow.
Treadwell & Co	San Francisco	One Treadwell sulky single sod plow.
Matteson & Williamson	Stockton	Two single plows (California manufacture).
Matteson & Williamson	Stockton	One sulky plow (California manufacture).
Matteson & Williamson	Stockton	One four-gang eight-inch two-edged plow (California manufacture).
W. B. Ready	Sacramento	Three two-gang plows.
W. B. Ready	Sacramento	One three-gang plow.
W. B. Ready	Sacramento	Two stubble plows.
C. Meyers	Marysville	One two-gang plow.
C. Meyers	Marysville	One subsoil gang plow.

CLASS VII.

Exhibitor.	Post Office.	Article.
E. E. Ames	Sacramento	One spring market wagon.
E. E. Ames	Sacramento	One spring market wagon.
E. E. Ames	Sacramento	One iron axle farm wagon for general purposes.
E. E. Ames	Sacramento	One thimbleskein farm wagon for general purposes.
E. E. Ames	Sacramento	One thimbleskein farm wagon for general purposes.
E. E. Ames	Sacramento	Sarven patent carriage wheels.
Baker & Hamilton	Sacramento	Two Bain farm wagons.
Sweepstakes Plow Co., Baker & Hamilton, agents.	Sacramento	Four Sweepstakes spring market and road wagons.
Wm. Harrison, Ives, agent	Grand Rapids, Michigan	Two thimbleskein Harrison farm wagons.
James McRossie	Sacramento	One two-horse truck (California manufacture).
Keller & Co	Sacramento	Three Fish Bros. Pacific wagons.
Keller & Co	Sacramento	Two E. W. Walker's push carts.
Keller & Co	Sacramento	Best wagon brake.
M. C. Hawley & Co	Sacramento	One two and one half-inch Schuttler wagon gear.
M. C. Hawley & Co	Sacramento	One two and one quarter-inch Schuttler farm wagon.
M. C. Hawley & Co	Sacramento	One one and three quarter-inch Schuttler farm wagon for general purposes.
M. C. Hawley & Co	Sacramento	One three and one half-inch thimbleskein Schuttler farm wagon for general purposes.
M. C. Hawley & Co	Sacramento	One three-inch thimbleskein Schuttler farm wagon for general purposes.
M. C. Hawley & Co	Sacramento	One four-inch thimbleskein back-action Schuttler wagon.
M. C. Hawley & Co	Sacramento	One spring market wagon (combination axle).
Treadwell & Co	San Francisco	One farm wagon.
Treadwell & Co	San Francisco	One freight wagon.
J. F. Hill	Sacramento	One eight-horse wagon (claim as best for general purposes).
J. F. Hill	Sacramento	One four-horse wagon (claim as best for general purposes).
J. F. Hill	Sacramento	Three two-horse wagons (claim as best for general purposes).
J. F. Hill	Sacramento	One thoroughbrace wagon (claim as best for general purposes).
J. F. Hill	Sacramento	One top family wagon (claim as best for general purposes).
J. F. Hill	Sacramento	One street goods wagon (claim as best for general purposes).
Martin Kestler	Sacramento	One two-horse wagon (claim as best for general purposes).
Martin Kestler	Sacramento	One four-horse wagon (claim as best for general purposes).
Miles & Evans	San Francisco	One iron axle Mitchell farm wagon.
Miles & Evans	San Francisco	Two thimbleskein Mitchell farm wagons.

ARTICLES EXHIBITED AT THE PAVILION.

ARTICLES EXHIBITED AT THE PAVILION.

[LOWER HALL.]

SECOND DEPARTMENT.

CLASS I—MACHINERY, IMPLEMENTS, ETC.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 20...	T. C. Churchman, Sacramento.....	3	One model Monitor snow plow.
Sept. 21...	J. M. Keeler & Co., San Francisco.	4	One Kipp engine.
"	Huntington, Hopkins & Co., Sacramento	5	One saw gummer.

CLASS II.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 21...	Huntington, Hopkins & Co., Sacramento.....	1	One lawn mower.
"	Huntington, Hopkins & Co., Sacramento.....	1	One gopher trap.
"	Huntington, Hopkins & Co., Sacramento.....	1	One post-hole auger.
"	Huntington, Hopkins & Co., Sacramento.....	1	One vegetable cutter.
"	Huntington, Hopkins & Co., Sacramento.....	1	One lawn sprinkler.

CLASS IV.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	V. S. W. Parkhurst, San Francisco	1	Fourteen Howe's U. S. standard counter scales.
"	V. S. W. Parkhurst, San Francisco	1	Five Howe's U. S. portable scales.
"	V. S. W. Parkhurst, San Francisco	1	One Howe's U. S. dormant scale.
"	V. S. W. Parkhurst, San Francisco	1	Two Howe's U. S. Post Office scales.
"	Nash, Miller & Co., Sacramento	2	One grain separator and fanning mill.
Sept. 21...	John Wilkie, Sutter County	3	One patent machine for applying bluestone to seed wheat or grain.
"	H. M. Cameron, Chicago, Illinois	4	One champion beehive.
"	H. M. Cameron, Chicago, Illinois	4	One combined feeder and ventilator for same.
"	H. M. Cameron, Chicago, Illinois	4	Two glass honey boxes.
"	H. M. Cameron, Chicago, Illinois	4	One queen cell protector.
"	Huntington, Hopkins & Co., Sacramento	5	Platform scales.
"	H. M. Cameron, Chicago, Illinois	6	One sectional honey box.

CLASS V.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	M. K. Barron, San Francisco	1	One double acting washing machine.
"	W. B. Ludlow, Sacramento	2	One Common Sense washing machine.
Sept. 20...	A. Parker, Hicksville, Sacramento County	3	Four Crane's washing machines.
"	J. H. Corliss, Reno, Nevada	4	Apparatus for measuring and drawing liquids.
Sept. 21...	J. M. Keeler & Co., San Francisco.	5	One Sluthour pump.
"	J. M. Keeler & Co., San Francisco.	6	One Ryder's American fruit dryer
"	Laufkotter Bros., Sacramento	7	One double acting deep well force pump.
"	Huntington, Hopkins & Co., Sacramento	8	One farm road scraper.
"	Huntington, Hopkins & Co., Sacramento	8	One cabbage cutter.
"	S. J. Whipple, Dutch Flat	9	One Whipple's rectangular churn.
"	Andrew Callahan, San Francisco	10	One washing machine, "The Complete Washer."
"	Josiah Biggs, Vallejo	11	One Humboldt washing machine.
Sept. 23...	Dr. L. L. Moore, Santa Cruz	12	One Jones' pneumatic evaporator, for drying fruits, vegetables, etc.

CLASS VII.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 21...	Daniel Mason, Sacramento.....	1	Two trotting wagons.
"	James F. Hill, Sacramento.....	2	One one-horse family carriage, "Eureka."
"	James J. Hill, Sacramento.....	2	One two-seat family carriage, "Eureka."
"	Doland & Co., Sacramento.....	3	Three top buggies.
"	Doland & Co., Sacramento.....	3	One top wagon.
"	Doland & Co., Sacramento.....	3	One phaeton.
"	Doland & Co., Sacramento.....	3	One sulky.
"	Huntington, Hopkins & Co., Sacramento	4	Assortment of carriage material and trimmings.
"	Huntington, Hopkins & Co., Sacramento	4	Carriage springs.
"	Daniel Mason, Sacramento.....	5	Columbus B. & M. carriage wheels.
"	Daniel Mason, Sacramento.....	5	One family carriage, one-horse.
Sept. 23...	Carvill Manufacturing Company, San Francisco.....	6	One two-horse family carriage.
"	Carvill Manufacturing Company, San Francisco.....	6	One one-horse family carriage.
"	Carvill Manufacturing Company, San Francisco.....	6	One top buggy.
"	G. C. McMullen, Suisun.....	7	One neck yoke buggy, California invention, patented.

THIRD DEPARTMENT.

CLASS II.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 21...	Huntington, Hopkins & Co., Sacramento.....	1	Rubber hose and belting.
"	Huntington, Hopkins & Co., Sacramento.....	1	Leather belting.

FOURTH DEPARTMENT.

CLASS I.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	Warren Holt, San Francisco.....	1	One set single action gate hinges, Norton's.
"	Warren Holt, San Francisco.....	1	One set double action gate hinges, Norton's.
"	Warren Holt, San Francisco.....	1	Norton's door butts.
"	Gillig, Mott & Co., Sacramento...	2	Jewett's water coolers and filters.
"	Gillig, Mott & Co., Sacramento...	2	Coach lamps.
"	Gillig, Mott & Co., Sacramento, for J. L. Stevenson, Virginia, Nevada.....	2	Miners' safety candlestick.
"	Gillig, Mott & Co., Sacramento, for J. L. Stevenson, Virginia, Nevada	2	Metal-lined wooden pails.
Sept. 20...	G. Hellge, Sacramento.....	3	Three locks—store, house, and padlock.
Sept. 21...	Gabriel Thomas, Reno, Nevada...	4	One automatic car coupling.
"	J. M. Keeler & Co., San Francisco.	5	One Chase pipe-cutting machine.
"	C. B. Brown, Placerville.....	6	Two hydraulic mining lamps.
"	G. A. Potter, San Francisco.....	7	The Excelsior cooking utensils.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot brass work.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot axes.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot general hardware.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot iron and steel.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot table cutlery.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot mechanics' tools.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot pocket cutlery.
"	Huntington, Hopkins & Co., Sacramento	8	One lot circular saws.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot mill saws.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot handsaws.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot files.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot pruning knives.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot shot.
"	Huntington, Hopkins & Co., Sacramento.....	8	One lot anti-friction metal.
"	M. C. Hawley & Co., Sacramento.	9	Six metal cans.
"	P. J. Chrisler, Vallejo.....	10	Six can openers.

CLASS II.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	Gillig, Mott & Co., Sacramento....	1	Eight Rathbone ranges.
Sept. 21...	Wm. Friel, San Francisco.....	2	Paragon vapor-stove burner, California invention.

CLASS III.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	Warren Holt, San Francisco.....	1	One "Childs'" improved patent folding desk and seat.

ARTICLES EXHIBITED AT THE PAVILION—UPPER HALL.

THIRD DEPARTMENT.

CLASS I.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	Mrs. E. Reinersman, Sacramento.	4	Two rag rugs.
"	S. Tryon, Agent Capital Woolen Mills, Sacramento.....	5	Best display of woolen goods from one manufactory.
"	Mrs. M. Gerrish, Sacramento.....	6	Two bedquilts.
Sept. 21...	Mrs. T. F. McDerman, Sacramento.....	9	Two rag rugs.
"	Joseph Green, Oakland	10	Best exhibition of silk goods by one factory, "silk ribbons."
"	M. Kraker, Sacramento.....	11	Best display of shoulder braces and corsets.
"	M. Kraker, Sacramento.....	11	Best display of dry goods.
"	M. Kraker, Sacramento.....	11	Best display of fancy goods.
Sept. 17...	Mrs. F. N. Fish, Sacramento.....	1	Six crochet tidies.
"	Mrs. F. N. Fish, Sacramento.....	1	One tatting tidy.
"	Mrs. F. N. Fish, Sacramento.....	1	One thread tidy.

CLASS I—Continued.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 17...	Mrs. F. N. Fish, Sacramento.....	1	One wool tidy.
"	Mrs. F. N. Fish, Sacramento.....	1	Four Java canvas tidies.
"	Mrs. F. N. Fish, Sacramento.....	1	Twenty yards crochet lace.
"	Mrs. F. N. Fish, Sacramento.....	1	Two lamp mats.
"	Mrs. F. N. Fish, Sacramento.....	1	One hair bouquet.
"	Mrs. F. N. Fish, Sacramento.....	1	One vase wool flowers.
Sept. 18...	Mrs. Christina Nehrbass (70 years of age), Sacramento.....	2	Twenty pairs knitted stockings.
"	Mrs. Christina Nehrbass (70 years of age), Sacramento.....	2	Two pairs knitted socks.
"	Mrs. Christina Nehrbass (70 years of age), Sacramento.....	2	One cover and sofa pillow, knit.
"	Mrs. Christina Nehrbass (70 years of age), Sacramento.....	2	One tidy.
"	Mrs. Christina Nehrbass (70 years of age), Sacramento.....	2	One bedspread, knit.
Sept. 19...	Mrs. R. W. Murphy, Sacramento.	3	One lot artificial flowers.
"	Mrs. R. W. Murphy, Sacramento.	3	Lot silk bonnets.
"	Mrs. R. W. Murphy, Sacramento.	3	Lot velvet bonnets.
"	Mrs. R. W. Murphy, Sacramento.	3	Lot millinery.
Sept. 21...	Frazee & Scullion, Sacramento.....	3	Three sets carriage harness.
"	Frazee & Scullion, Sacramento.....	3	One set single harness.
"	Frazee & Scullion, Sacramento.....	3	Three saddles (Mexican).
Sept. 17...	Mrs. L. A. Barton, Sacramento ...	.....	Two shell vases and frames.
Sept. 19...	Mrs. C. W. Clarke, Sacramento...	.....	One silk quilt.
"	Madame C. Romer, Sacramento...	4	One dressed figure.
"	Mrs. Jessie Collier, Sacramento...	5	One chemise.
"	Mrs. Jessie Collier, Sacramento...	5	One lady's apron.
"	Mrs. T. M. Logan, Sacramento....	6	Child's crochet leggings.
"	Mrs. T. M. Logan, Sacramento....	6	Child's crochet hood.
"	Mrs. T. M. Logan, Sacramento....	6	Child's crochet sacque.
"	Miss Jovette M. Pierce, Sacramento.....	7	One hair wreath.
"	Miss Jovette M. Pierce, Sacramento.....	7	One feather wreath.
"	Miss Jovette M. Pierce, Sacramento.....	7	One crochet table cover.
"	Miss Jovette M. Pierce, Sacramento.....	7	One tatting tidy.
"	Miss Jovette M. Pierce, Sacramento.....	7	One tatting collar.
"	Miss Jovette M. Pierce, Sacramento.....	7	One pair toilet mats.
"	Miss Jovette M. Pierce, Sacramento.....	7	One pair worsted embroidered suspenders.
"	A. Manning, Sacramento.....	8	One fruit and seed wreath.
"	G. D. Allmond & Brother.....	9	Six dozen pairs of gloves.
"	G. D. Allmond & Brother.....	9	Four pairs mittens.
"	Mrs. R. H. Haskell, Sacramento...	10	One pair knit cotton stockings.
"	Mrs. R. H. Haskell, Sacramento...	10	One embroidered sofa pillow cover.
"	Miss Isabella Sibenthaler, Sacramento.....	11	One crochet quilt.
"	E. Reinersman, Sacramento.....	2	Rag rugs.
"	S. Tryon, Agent for Sacramento Woolen Mills, Sacramento.....	5	Woolen goods.
"	Mrs. M. Gerrish, Sacramento.....	6	Two bedquilts.
"	James Parsons, Sacramento.....	7	One case ladies' boots and shoes.
Sept. 21...	Mrs. J. F. McDorman, Sacramento	9	Two rag rugs.
"	Joseph Green, Oakland.....	10	Silk ribbon.
"	M. Kraker, Sacramento.....	11	Shoulder brace and corsets.
"	M. Kraker, Sacramento.....	11	Dry goods.
"	M. Kraker, Sacramento.....	11	Fancy goods.

CLASS I—Continued.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	J. C. Meussdorffer, Sacramento ...	1	One case gent's silk hats.
"	J. C. Meussdorffer, Sacramento ...	1	One case soft and stiff hats.
"	J. C. Meussdorffer, Sacramento ...	1	One case boys' hats and caps.
"	D. H. Quinn, Sacramento.....	2	Four silk hats.
"	D. H. Quinn, Sacramento.....	2	One and one half dozen boys' hats.
"	D. H. Quinn, Sacramento.....	2	Twenty-eight men's hats, soft.
Sept. 21...	S. S. Kast, San Francisco.....	4	One pair dressed gent's boots.
"	S. S. Kast, San Francisco.....	4	One pair gent's heavy riding boots.
"	S. S. Kast, San Francisco.....	4	One pair gent's dressed shoes.
"	S. S. Kast, San Francisco.....	4	One pair gent's Congress gaiters.
"	S. S. Kast, San Francisco.....	4	One pair ladies' slippers.
"	S. S. Kast, San Francisco.....	4	One pair ladies' gaiters.
"	S. S. Kast, San Francisco.....	4	One pair ladies' bootees.
"	S. S. Kast, San Francisco.....	4	One pair gent's boots.
"	S. S. Kast, San Francisco	4	One pair boys' gaiters.
"	S. S. Kast, San Francisco.....	4	One pair girl's gaiters.
"	S. S. Kast, San Francisco.....	4	Eleven pairs slipper bows.

CLASS II.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	James Parsons, Sacramento.....	7	One case ladies' boots and shoes.
"	J. C. Meussdorffer, Sacramento....	1	One case gent's silk hats.
"	J. C. Meussdorffer, Sacramento....	1	One case gent's soft and stiff hats.
"	J. C. Meussdorffer, Sacramento....	1	One case boys' hats and caps.
"	D. H. Quinn, Sacramento.....	2	Four silk hats.
"	D. H. Quinn, Sacramento.....	2	One and one half dozen boys' hats.
"	D. H. Quinn, Sacramento.....	2	Twenty-eight men's soft hats.
Sept. 21...	Frazee & Scullion, Sacramento.....	3	Three sets carriage harness.
"	Frazee & Scullion, Sacramento.....	3	One set single harness.
"	Frazee & Scullion, Sacramento.....	3	Three Mexican saddles.
"	S. S. Kast, San Francisco.....	4	One pair gent's dress boots (California manufacture).
"	S. S. Kast, San Francisco.....	4	One pair gent's heavy riding boots (California manufacture).
"	S. S. Kast, San Francisco.....	4	One pair gent's dress shoes (California manufacture).
"	S. S. Kast, San Francisco.....	4	One pair gent's Congress gaiters (California manufacture).
"	S. S. Kast, San Francisco.....	4	One pair ladies' slippers (California manufacture).
"	S. S. Kast, San Francisco.....	4	One pair ladies' gaiters (California manufacture).
"	S. S. Kast, San Francisco.....	4	One pair ladies' bootees (California manufacture).
"	S. S. Kast, San Francisco.....	4	One pair gent's boots (California manufacture).
"	S. S. Kast, San Francisco.....	4	One pair boys' gaiters (California manufacture).
"	S. S. Kast, San Francisco.....	4	One pair girls' gaiters (California manufacture).
"	S. S. Kast, San Francisco.....	4	Eleven pairs slipper bows (California manufacture).

CLASS II—Continued.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	R. Stone & Co., Sacramento.....	15	Display of carriage harness.
"	R. Stone & Co., Sacramento.....	15	Display of buggy harness.
"	R. Stone & Co., Sacramento.....	15	Display of farm harness.
"	R. Stone & Co., Sacramento.....	15	Mexican saddle and bridle.
"	R. Stone & Co., Sacramento.....	15	Ladies' saddle and bridle.
"	R. Stone & Co., Sacramento.....	15	Display of hames.
"	R. Stone & Co., Sacramento.....	15	Display of horse clothing and carriage robes.
"	R. Stone & Co., Sacramento.....	15	Display of bits and spurs.
"	R. Stone & Co., Sacra nento.....	15	Display of horse collars.

CLASS III.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	Mrs. H. A. Weaver, Sacramento..	12	One embroidered nightdress.
"	Mrs. H. A. Weaver, Sacramento..	12	One embroidered tidy.
"	Mrs. M. E. Miller, Sacramento....	13	One embroidered sofa cushion.
"	Mrs. M. E. Miller, Sacramento....	13	One embroidered picture.
"	Mrs. M. E. Miller, Sacramento....	13	One worsted wreath.
"	Mrs. M. E. Miller, Sacramento....	13	Two hanging baskets.
"	Mrs. J. C. Roley, Sacramento.....	13	One worsted picture (Ship of State).
"	R. A. Branton, Dixon.....	14	One tulip quilt.
"	R. Stone & Co., Sacramento.....	15	Carriage harness.
"	R. Stone & Co., Sacramento.....	15	Buggy harness.
"	R. Stone & Co., Sacramento.....	15	Farm harness.
"	R. Stone & Co., Sacramento.....	15	Mexican saddle and bridle.
"	R. Stone & Co., Sacramento.....	15	Ladies' saddle and bridle.
"	R. Stone & Co., Sacramento.....	15	Hames.
"	R. Stone & Co., Sacramento.....	15	Horse clothing and carriage robes.
"	R. Stone & Co., Sacramento.....	15	Bits and spurs of all kinds.
"	R. Stone & Co., Sacramento.....	15	Horse collars.
Sept. 20...	Miss Gussie N. Wilcox, Sacramento.....	14	One hair wreath.
"	Miss Gussie N. Wilcox, Sacramento.....	14	One wreath Autumn flowers.
"	Miss Gussie N. Wilcox, Sacramento.....	14	Two snow-flake hanging baskets.
"	Miss Gussie N. Wilcox, Sacramento.....	14	One crochet tidy.
"	Miss Gussie N. Wilcox, Sacramento.....	14	One Java canvas tidy.
"	D. H. Quinn, Sacramento.....	15	Collection of furs.
"	D. H. Quinn, Sacramento.....	15	Three silk caps.
"	D. H. Quinn, Sacramento.....	15	Nineteen pairs of gloves.
"	Alex. Mackey, San Francisco.....	16	Three rolls of rag carpet.
"	Mrs. H. D. Nash, Sacramento.....	17	One worsted cover for chair bottom.
"	Mrs. Joseph Idiens, Sacramento...	18	One alum basket crystallized flowers.
"	Mrs. Mary A. Beck, Sacramento..	19	One wax cross.
"	Mrs. Mary A. Beck, Sacramento..	19	One wax bouquet.
"	Miss Sarah Neff, Sacramento.....	20	One set braid toilet mats.
"	Miss Irene Felter, Sacramento.....	21	One silk lounge afghan.

CLASS III—Continued.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 20...	Mrs. D. W. Welty, Sacramento..	22	Four pieces bead work.
"	Mrs. J. D. Storch, Sacramento.....	23	One hair wreath.
"	Mrs. W. N. Lyon, Sacramento....	24	One wax cross.
"	Mrs. W. N. Lyon, Sacramento....	24	One vase Autumn leaves.
"	Mrs. W. N. Lyon, Sacramento....	24	One bouquet phantom flowers.
"	Mrs. W. N. Lyon, Sacramento....	24	One pair embroidered pillow shams.
"	Mrs. W. N. Lyon, Sacramento....	24	One pair embroidered handkerchiefs.
"	Mrs. W. N. Lyon, Sacramento....	24	One paper case embroidered with chenille.
"	Mrs. W. N. Lyon, Sacramento....	24	Two jewel caskets.
"	Mrs. W. N. Lyon, Sacramento....	24	One cornucopia.
"	Mrs. W. N. Lyon, Sacramento....	24	One hairpin basket.
"	Mrs. W. N. Lyon, Sacramento....	24	One piece flannel embroidery.
"	Mrs. H. J. Jackson, Elk Grove....	25	One log cabin quilt.
"	Mrs. Chas. Arnold, Sacramento...	26	Two pieces embroidery.
"	Mrs. M. T. Griffin, Sacramento....	27	One pair worsted tidies.
"	Mrs. M. T. Griffin, Sacramento....	27	One case dress patterns.
Sept. 21...	Mrs. C. N. Hartwell, Sacramento.	28	One cross of pebbles, shells, and sea moss.
"	Miss Irene Felter, Sacramento.....	29	One sofa pillow cover, worsted.
"	Miss Irene Felter, Sacramento.....	29	One lace tidy.
"	Miss Irene Felter, Sacramento.....	29	One worsted scrap bag.
"	Miss Agnes Hummel, Sacramento.	30	Twelve pieces embroidery and fancy work.
"	Mrs. A. Theiss, Sacramento.....	31	One lot lace work.
"	Miss Mary Batcher, Sacramento...	32	One lot flannel embroidery.
"	Mrs. Wm. Kendall, Sacramento...	33	One pair cotton socks.
"	Mrs. H. H. Pierson, Sacramento..	34	One crochet afghan.
"	Mrs. H. H. Pierson, Sacramento..	34	One piece tapestry.
"	Mrs. H. H. Pierson, Sacramento..	34	One sofa cover, crochet.
"	Mrs. Dwight Pierce, Sacramento..	35	One bedquilt.
"	Mrs. Dwight Pierce, Sacramento..	35	One rag footmat.
"	Miss Agnes Hummel, Sacramento.	36	Two cushion covers, silk embroidery.
"	Miss Agnes Hummel, Sacramento.	36	Two cotton tidies.
"	Miss Agnes Hummel, Sacramento.	36	One toilet set, seven pieces, pink.
"	Miss Agnes Hummel, Sacramento.	36	One toilet set, seven pieces, blue.
"	Madame Anna Getz Lucas, San Francisco.....	37	One case natural flowers, preserved and enameled.
"	Madame Anna Getz Lucas, San Francisco.....	38	One basket natural flowers, preserved without enamel.
"	Madame Anna Getz Lucas, San Francisco.....	39	One case pond lilies, in wax.
"	Madame Anna Getz Lucas, San Francisco.....	39	One vase rosebuds and flowers.
"	Madame Anna Getz Lucas, San Francisco.....	40	One vase Autumn leaves.
"	Madame Anna Getz Lucas, San Francisco.....	41	One basket wax fruit, thirty varieties.
"	Madame Anna Getz Lucas, San Francisco.....	42	One case best specimen wax fruit on branches.
"	Madame Anna Getz Lucas, San Francisco.....	43	One case Japanese lily and American tulip tree in wax.
"	Madame Anna Getz Lucas, San Francisco.....	44	Case, hand from a living model, wax statuary.
"	Mrs. M. J. Favre, Sacramento.....	45	One patchwork quilt.
"	Mrs. John Isaacs, Sacramento.....	46	One log cabin quilt.
"	Mrs. E. F. Bane, Davisville.....	47	Two hanging baskets, rag work.
"	Mrs. M. T. Brewer, Sacramento...	48	One rag rug.
"	Mrs. M. T. Brewer, Sacramento...	48	Two pieces lace embroidery.

CLASS III—Continued.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 21...	Mrs. J. F. Hill, Sacramento.....	49	Five rag rugs.
"	Miss A. Hubbard, Sierra Valley...	50	Two worsted rugs, with patterns.
"	Mrs. James Lansing, Sacramento.	51	One down quilt.
"	Mrs. James Lansing, Sacramento.	51	One pair down pillows.
"	Mrs. James Lansing, Sacramento.	51	One hand embroidered lady's skirt.
"	Mrs. James Lansing, Sacramento.	51	One hand embroidered lady's chemise.
"	Mrs. C. N. Hartwell, Sacramento.	52	One sea moss bouquet.
"	Mrs. C. N. Hartwell, Sacramento.	52	One shell monument.
"	Mrs. W. E. Wood, Oakland.....	53	One embroidered chair seat.
"	Mrs. L. Howe, Woodland.....	54	One worsted sofa pillow.
"	Mrs. L. Howe, Woodland.....	54	One bead toilet cushion.
"	Mrs. E. N. Wilson, Elk Grove....	55	One pair chair tidies, worsted.
"	Mrs. E. N. Wilson, Elk Grove.....	55	One buggy robe, worsted.
"	Mrs. Mary H. Chambers, San Francisco.....	56	One embroidered afghan.
"	Mrs. O. H. Wing, Sacramento.....	57	One wax cross.
"	Mrs. H. Kuhl, Sacramento.....	58	One case knit and worsted goods.
"	Mrs. H. Kuhl, Sacramento.....	58	One lot children and ladies' wear.
"	Mrs. H. Kuhl, Sacramento.....	58	One ottoman cover; crochet shawl.
"	Mrs. H. Kuhl, Sacramento.....	58	One lamp stand mat; silk embroidery.
"	Mrs. H. Kuhl, Sacramento.....	58	Child's afghan; children's clothing.
"	Mrs. Dan. McCarthy, Sacramento.	59	One toilet cushion.
"	Mrs. Dan. McCarthy, Sacramento.	59	One daisy mat.
"	Mrs. Dan. McCarthy, Sacramento.	59	One embroidered shirt.
Sept. 22...	Mrs. Mary Barnes, Truckee.....	60	One wreath zephyr artificial flowers.
"	Mrs. Mary Barnes, Truckee.....	60	One bouquet zephyr artificial flowers.

FOURTH DEPARTMENT.

CLASS I.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 17...	George W. Ames, Sacramento.....	1	Patent window blind hinge.
Sept. 19...	Sol. H. Davis, Sacramento.....	2	One case mechanics' tools.
"	Sol. H. Davis, Sacramento.....	2	One California farmers' tool chest.
"	John Breuner, Sacramento.....	3	One laurel and walnut trimmed bedstead.
"	John Breuner, Sacramento.....	3	One laurel and walnut dressing bureau.
"	John Breuner, Sacramento.....	3	One laurel washstand.
"	John Breuner, Sacramento.....	3	One laurel somino.
"	John Breuner, Sacramento.....	3	One laurel table.

CLASS I—Continued.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	John Breuner, Sacramento.....	3	One laurel wardrobe.
"	John Breuner, Sacramento.....	3	One laurel office desk.
"	John Breuner, Sacramento.....	3	One laurel lounge in brocatelle.
"	John Breuner, Sacramento.....	3	One laurel writing desk.
"	John Breuner, Sacramento.....	3	One laurel office chair, in leather.
"	John Breuner, Sacramento.....	3	One rosewood and walnut book case.
"	John Breuner, Sacramento.....	3	Two rosewood side tables.
"	John Breuner, Sacramento.....	3	One rosewood marble-top center table.
"	John Breuner, Sacramento.....	3	Two fancy embroidered chairs.
"	John Breuner, Sacramento.....	3	One Turkish sick chair.
"	John Breuner, Sacramento.....	3	One etagere.
"	John Breuner, Sacramento.....	3	One music case.
"	John Breuner, Sacramento.....	3	One chamber set (seven pieces).
"	John Breuner, Sacramento.....	3	One sofa, in brocatelle.
"	John Breuner, Sacramento.....	3	Two easy chairs, in brocatelle.
"	John Breuner, Sacramento.....	3	Four parlor chairs, in brocatelle.
"	John Breuner, Sacramento.....	3	One parlor set, in green tapestry (seven pieces).
"	John Breuner, Sacramento.....	3	One parlor set, in brown and Brussels.
"	John Breuner, Sacramento.....	3	One twelve-foot extension table.
"	John Breuner, Sacramento.....	3	Two spring mattresses.
"	John Breuner, Sacramento.....	3	One hair mattress.
"	John Breuner, Sacramento.....	3	Two feather pillows.
"	John Breuner, Sacramento.....	3	One looking glass.
"	John Breuner, Sacramento.....	3	One feather bolster.
"	J. F. Harrison & Co., Sacramento.	4	One case plated ware.
"	Bush Brothers, Sacramento	5	Seventeen gas chandeliers.
"	Bush Brothers, Sacramento	5	Two newel lights.
"	Bush Brothers, Sacramento	5	Eight portable lamps.
"	Bush Brothers, Sacramento	5	Two glass shades.
"	Bush Brothers, Sacramento	5	One gas toddy kettle.
"	Bush Brothers, Sacramento	5	Two gas flatirons.
Sept. 21...	Wick & Clark, Sacramento.....	6	Two cases of coffin and casket handles.
"	Wick & Clark, Sacramento.....	6	Emblems and plates.
"	J. Hurtell, Rocklin	7	Models of stonecutter's tools.

CLASS II.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 21...	Wick & Clark, Sacramento.....	1	One metallic burial case.
"	A. Menke, Sacramento.....	2	Three ornamental statues.
"	A. Menke, Sacramento.....	2	One lot paper hangings.
"	A. Menke, Sacramento.....	2	Three writing desks.
"	A. Menke, Sacramento.....	2	One lot shell boxes.
"	A. Menke, Sacramento.....	3	One lot bead embroidery.

CLASS III.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	H. O. Briggs & Co	1	Two spring beds.
"	A. Menke, Sacramento	2	One fine violoncello.
"	A. Menke, Sacramento	2	One fine violin.
"	A. Menke, Sacramento	2	Two fine guitars.
"	A. Menke, Sacramento	2	Two fine banjos.
"	A. Menke, Sacramento	2	Three fine German accordeons.
"	A. Menke, Sacramento	2	One fine flute (ivory mouthpiece).
"	A. Menke, Sacramento	2	One fine flute (silver mouthpiece).
"	A. Menke, Sacramento	2	One fine flute (wood mouthpiece).
"	A. Menke, Sacramento	2	Four pocket harmonicas.
"	A. Menke, Sacramento	2	Four pocket harmonicas (concert).
"	A. Menke, Sacramento	2	Two piccolos.
"	A. Menke, Sacramento	2	Two fifes.
"	A. Menke, Sacramento	2	One Martin guitar.
"	A. Menke, Sacramento	2	Five ivory-tipped paper holders.
"	A. Menke, Sacramento	2	Two black walnut paper holders.
"	A. Menke, Sacramento	2	Three black walnut clock shelves.
"	A. Menke, Sacramento	2	Seven bl'k walnut corner brackets.
"	A. Menke, Sacramento	2	Three black walnut side brackets.
"	A. Menke, Sacramento	2	Four black walnut comb and brush holders.
"	Kohler, Chase & Co., San Francisco	3	One concert grand piano (Decker Brothers).
"	Kohler, Chase & Co., San Francisco	3	Two square pianos (Decker Bros).
"	Kohler, Chase & Co., San Francisco	3	Two pianos (Emerson's).
"	Kohler, Chase & Co., San Francisco	3	One upright piano.
"	Kohler, Chase & Co., San Francisco	3	Three piano stools.
Sept. 21...	Rickoff & Clark, San Francisco	4	Three spring beds.
"	P. Liesenfeld, San Francisco	5	One billiard table.
"	P. Liesenfeld, San Francisco	5	One monitor and pigeon-hole table combined.
"	W. D. Comstock, San Francisco		One " Lane's " patent curled wool mattress.
"	A. Menke, Sacramento	6	Two California made boxes (inlaid).
"	A. Menke, Sacramento	6	Two oval clothes hampers.
"	S. B. Sherburne & Co., Sacramento	7	One patent spring bed cover.
"	T. W. Strobridge, Jr., Sacramento.	8	One orchestral grand piano (Hallet, Davis & Co.)
"	T. W. Strobridge, Jr., Sacramento.	8	Two square pianos (Hallet, Davis & Co).
"	T. W. Strobridge, Jr., Sacramento.	8	One boudoir piano (Hallet, Davis & Co).
"	T. W. Strobridge, Jr., Sacramento.	8	One parlor piano (Hallet, Davis & Co).
"	T. W. Strobridge, Jr., Sacramento.	8	Three organs (Geo. Woods & Co).
"	W. H. Smith, San Francisco	9	Seven Champion spring beds.
"	I. J. Hattabaugh, San José	10	One wire suspension spring bed (California invention).
Sept. 23...	Jacob Strahle & Co., San Francisco	11	One billiard table, laurel and redwood, with cue rack.

CLASS IV.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	A. Menke, Sacramento.....	1	Assortment of brushes.
Sept. 21...	John F. Cooper, Sacramento.....	2	Four Estey organs.
"	A. Menke, Sacramento.....	3	Assortment of gilt frames.

CLASSES V TO IX.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 18...	C. Jurgens, Sacramento.....	1	Forty-three packages of glue, California manufacture.
Sept. 20...	R. E. Gogings, Sacramento.....	2	Collection of stuffed animals, birds, etc.
"	J. K. Firth, San Francisco.....	3	Drawing of compound engine for steam yacht, with details.
"	Robert Moore, San Francisco.....	4	Two drawings of Eppleshiema's patent hoisting engine.
Sept. 21...	G. D. Allmond, Sacramento.....	5	One case minerals.
"	W. C. Harding, Sacramento.....	6	Specimens of dentistry.
"	Derwin & Hedric, Sacramento.....	7	Patent axle grease.
"	G. Griffith, Rocklin.....	8	One piece dry dock stone.
"	Mansfield, Wing & Co., Sacramento.....	9	Assortment of fancy moldings.
"	J. F. Fugazi, Sacramento.....	10	One case perfumery—hair restorer, hair dyes, sparkling cologne fountain, and toilet articles.
"	B. R. Sweetland, Sacramento.....	11	One case minerals and shells.
"	Bowen Bros., San Francisco.....	12	Display of yeast powders, California manufacture.
"	Carlton Newman, San Francisco..	13	Half dozen half-gallon Newman's improved elastic demijohns.
"	Carlton Newman, San Francisco..	13	Half dozen one-gallon Newman's improved elastic demijohns.
"	Carlton Newman, San Francisco..	13	Half dozen two-gallon Newman's improved elastic demijohns.
"	Carlton Newman, San Francisco..	13	Half dozen five-gallon Newman's improved elastic demijohns.
"	Carlton Newman, San Francisco..	13	One half-gallon Newman's improved elastic demijohn, showing cushion of tule.
"	Carlton Newman, San Francisco..	13	One one-gallon Newman's improved elastic demijohn, showing cushion of tule.
"	Carlton Newman, San Francisco..	13	Three dozen half-gallon grooved ring fruit jars.
"	Carlton Newman, San Francisco..	13	Three dozen quarter-gallon grooved ring fruit jars.

FIFTH DEPARTMENT.

CLASS I.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 21...	B. R. Prince, Altaville, Calaveras County	1	One case silk cocoons.
"	B. R. Prince, Altaville, Calaveras County	1	Nine skeins silk, raw.

CLASS VII.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	Beet Sugar Co., Capital Sugar Refinery, Sacramento	1	One lot of sugar in jars, and sugar beets.
"	Mrs. M. Hoover, Elk Grove	2	Seventy-six varieties jellies.
"	Mrs. M. Hoover, Elk Grove	2	Forty-three varieties spiced fruit.
"	Mrs. M. Hoover, Elk Grove	2	Forty-nine varieties preserves.
"	Mrs. M. Hoover, Elk Grove	2	Forty-four varieties fresh fruit.
"	Mrs. M. Hoover, Elk Grove	2	Sixty-three varieties plain pickles.
"	Mrs. M. Hoover, Elk Grove	2	Six varieties salads.
"	Mrs. M. Hoover, Elk Grove	2	Six varieties tapioca fruit.
"	Mrs. M. Hoover, Elk Grove	2	Eleven varieties brandied fruit.
"	Mrs. M. Hoover, Elk Grove	2	Ten varieties fruit butter.
"	Mrs. M. Hoover, Elk Grove	2	Eight varieties marmalade.
"	Mrs. M. Hoover, Elk Grove	2	Six varieties fruit cheese.
"	Mrs. M. Hoover, Elk Grove	2	Six varieties relishes.
Sept. 21...	Mrs. H. Cronkite, Elk Grove	3	Forty-one varieties preserved fruit: quince, cranberry, orange, lemon citron, rhubarb, ripe gooseberries, yellow cherries, black cherries, pie melon, lemon, wild blackberries.
"	Mrs. H. Cronkite, Elk Grove	4	Forty-one varieties pickles.
"	Mrs. H. Cronkite, Elk Grove	5	Fifty-six varieties jellies.
"	S. Goldman, Sacramento	6	One case spices, etc.
"	Mrs. James Lansing, Sacramento	7	Two varieties brandied peaches.
"	Mrs. James Lansing, Sacramento	7	One variety dark nectarines.
"	Mrs. James Lansing, Sacramento	7	One variety light nectarines.
"	Mrs. James Lansing, Sacramento	7	Two varieties grapes.
"	Mrs. James Lansing, Sacramento	7	One dozen jars plum jelly.
"	Mrs. James Lansing, Sacramento	7	Half dozen jars raspberry jelly.
"	Mrs. James Lansing, Sacramento	7	Half dozen bottles tomato catchup.
"	Mrs. James Lansing, Sacramento	7	Two decanters peach la cure.

SIXTH DEPARTMENT.

CLASS I.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	W. S. Manlove, Brighton.....	1	Varieties of apples, viz., King of Tompkins County, Rhode Island Greenings, Smith's Cider Swaar, Spitzenberg, Willow Twig, Yellow Bellflower, Newtown Pippin, Nicola Jack, Green Bellflower, Russet, Winter Pearmain, and Seedling.
"	W. S. Manlove, Brighton.....	1	One gallon syrup, Black Hamburg grape.
"	W. S. Manlove, Brighton.....	1	One gallon syrup, White Muscat of Alexandria.
"	T. K. Stewart, Sacramento.....	2	Twenty-two varieties of apples.
"	T. K. Stewart, Sacramento.....	2	Varieties of pears: Winter Nellis, Buro Clargo, Lawrence, Duchess, Orange, Esterburn.
"	T. K. Stewart, Sacramento.....	2	Three varieties pears, seedlings.
"	T. K. Stewart, Sacramento.....	2	Six varieties apples: Spitzenberg, Baldwin, White Winter Pearmain, Rambo, Bellflower, German Russet.
"	T. K. Stewart, Sacramento.....	2	One variety quinces.
"	T. K. Stewart, Sacramento.....	2	Five varieties tropical fruits, viz: olives, oranges, figs, almonds, seedling orange.
"	T. K. Stewart, Sacramento.....	2	One variety grapes, Mission.
"	T. K. Stewart, Sacramento.....	2	One variety plums, Yellow Egg.
"	G. W. Harlow, Sacramento.....	3	Two varieties apples, Red Astrachan, and Gravenstien.
"	G. W. Harlow, Sacramento.....	3	One variety pears, Black Worcester.
"	Joseph Putnam, Lockford, San Joaquin County.....	4	Twenty-one varieties apples.
"	Moses Sprague, Sacramento.....	5	Sixteen varieties grapes.
Sept. 21...	Mrs. W. B. Ludlow, Sacramento.	9	Varieties of orange quince.
"	Mrs. S. H. Gerrish, Sacramento...	10	Varieties of orange quince.
"	G. R. Grant, Roseville..	11	One variety clingstone peaches, seedlings.
"	Mrs. Amelia Cowne, Sacramento.	12	Two varieties apples, Spitzenberg and Baldwin.
"	Mrs. Amelia Cowne, Sacramento.	12	Varieties quinces.
"	Mrs. Amelia Cowne, Sacramento.	12	Varieties pears.
"	Mrs. Amelia Cowne, Sacramento.	12	One variety figs, blue.
"	J. F. Madden, Sacramento.....	13	One variety apples, Gloria Mundi.
"	C. H. Swift, Sacramento.....	14	Varieties quinces.
"	C. H. Swift, Sacramento.....	14	Varieties oranges, grown in Sacramento.
"	C. B. Brown, Placerville.....	15	Two varieties peaches.
"	C. W. Hoit, Sacramento.....	16	One variety Seekel pears.
"	S. H. Gerrish, Sacramento.....	18	Variety of Opuritta Occidentales, prickly pears.
"	Ira S. Bamber, Placerville.....	19	Seventy-seven varieties apples.
"	W. S. Manlove, Brighton.....	10	Varieties figs, purple and white.
"	E. M. Smith, Coloma.....	13	Thirteen varieties pears.
"	E. M. Smith, Coloma.....	13	Four varieties plums.
"	E. M. Smith, Coloma.....	13	Twenty-five varieties peaches.
"	E. M. Smith, Coloma.....	13	One variety quinces.
"	E. M. Smith, Coloma.....	13	Two varieties figs.

Class I—Continued.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 21...	E. M. Smith, Coloma	13	Nine varieties apples, Fall.
"	E. M. Smith, Coloma	13	Thirteen varieties apples, Winter.
"	Ira S. Bamber, Placerville	15	Sixteen varieties pears.
"	Ira S. Bamber, Placerville	15	Eighteen varieties peaches, seedlings.
"	Ira S. Bamber, Placerville	15	Nineteen varieties plums.
"	Ira S. Bamber, Placerville	15	Four varieties quinces.
"	Ira S. Bamber, Placerville	15	Twenty-four varieties of peaches, budded.

CLASS II.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 21...	Mrs. H. Cronkite, Elk Grove	6	One gallon grape syrup.
"	Mrs. H. Cronkite, Elk Grove	8	Eleven varieties dried berries.
"	Mrs. Amelia Cowne, Sacramento	12	One box dried apples.
"	Mrs. Amelia Cowne, Sacramento	12	One box dried pears.
"	Mrs. Amelia Cowne, Sacramento	12	One box dried peaches.
"	Mrs. Amelia Cowne, Sacramento	12	Two varieties almonds.
"	R. A. Rose, Sacramento	17	One box soft-shell almonds.
"	G. W. Dietzler, San Francisco	20	Seventeen varieties dried fruits and vegetables by the Alden process.
Sept. 19...	Miss Hattie E. Sprague, Sacramento	1	Four boxes dried apples, pears, plums, and sweet corn.
Sept. 21...	Master W. F. Knox, Sacramento.	2	One plate dried peaches.
"	Master Eddie Knox, Sacramento	3	One plate dried pomegranates.
"	Miss Tinnie M. Smith, Sacramento	6	Two boxes dried apples.
"	Miss Tinnie M. Smith, Sacramento	6	One box dried plums.
"	Joseph Purrington, Petaluma	9	Seven packages dried fruits—pears, plums, apples, peaches, nectarines, and raisins.
"	W. S. Manlove, Brighton	10	Soft-shell almonds.
"	J. A. Lewelling, St. Helena	12	Three varieties dried prunes.
"	J. A. Lewelling, St. Helena	12	One variety dried pears.

MISCELLANEOUS—GRAPES, BRANDIES, WINES, ETC.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 21...	Mrs. H. Cronkite, Elk Grove.....	4	Six bottles wine, one each of Sherry, White, Port, Sweet, Muscat, and Alderberry.
"	J. H. Carroll & Co., Sacramento..	5	Varieties of dry wines: three bottles White, six bottles Riesling, six bottles Orleans, three bottles Zinforthal, six bottles Red (native).
"	J. H. Carroll & Co., Sacramento..	5	Varieties of sweet wines: six bottles Angelica, six bottles Sherry, six bottles Sweet Muscat, three bottles Port.
"	J. H. Carrington, Sacramento.....	6	Nineteen varieties of grapes: Flaming Tokay, Golden Chasselas, Burgundy, White Syrian, Black Damascus, Muscat of Alexandria, White Chili, Rose de Peru, Muscadine, Fair Yagos, Dutch Sweetwater, Mission, Malvoisie, Black Hamburg, Black Morocco, Seedless Sultanoes, Madelaine, Catawba, Black St. Peter.
"	B. N. Bugbey, Folsom.....	7	Varieties of wines: three bottles Burgundy, one year old; three bottles California, one year old; three bottles Burgundy Port, two years old; three bottles California Red, one year old; three bottles Red Burgundy, three years old; three bottles Red Burgundy, two years old; three bottles White, one year old; three bottles California White, two years old; three bottles California Sherry, three bottles Port.
"	B. N. Bugbey, Folsom.....	7	Two bottles Muscatelle brandy, two years old.
"	B. N. Bugbey, Folsom.....	7	Two bottles grape brandy, three years old.
"	B. N. Bugbey, Folsom.....	7	Two bottles grape brandy, four years old.
"	James I. Felter (Johnson Brandy Co.), Sacramento.....	8	Samples of brandy.
"	W. S. Manlove, Brighton.....	10	Varieties of grapes: Muscat of Alexandria, Flaming Tokay, Black Hamburg, Blue Malvoisie, White Malaga, and Mission.
"	W. S. Manlove, Brighton.....	10	Varieties of wine grapes: Frankendale, Zinforthal, Burgundy, Riesling (white and gray), White Muscat, and Catawba.
"	J. R. Nickeson, Placer County....	11	One hundred and two varieties of grapes.
"	J. A. Lewelling, St. Helena.....	12	Three varieties of raisins.
"	E. M. Smith, Coloma.....	13	Fourteen varieties of grapes.
"	I. S. Bamber, Placerville.....	15	Thirteen varietes of grapes.
"	I. S. Bamber, Placerville.....	15	Twenty-five pounds of raisins.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1871, Catawba.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1872, Catawba.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1873, Catawba.

MISCELLANEOUS—Continued.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 21...	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1872, Muscat.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1873, Muscat.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1872, Port.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1873, Port.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1871, Hungarian.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1872, Hungarian.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1873, Hungarian.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1870, native.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1871, native.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1872, native.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1873, native.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1873, Burgundy Port.
"	Robert Chalmers, Coloma.....	14	Sweet wines, vintage of 1872, Coloma Vineyard.
"	Robert Chalmers, Coloma.....	14	Sweet wines, vintage of 1873, Coloma Vineyard.
"	Robert Chamlers, Coloma.....	14	Sweet wines, vintage of 1872, Angelica.
"	Robert Chalmers, Coloma.....	14	Sweet wines, vintage of 1873, Angelica.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1871, Isabella.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1873, Isabella.
"	Robert Chalmers, Coloma.....	14	Special wines, vintage of 1872, Sherry.
"	Robert Chalmers, Coloma.....	14	Dry wines, vintage of 1873, Claret.
"	Robert Chalmers, Coloma.....	14	Catawba wine bitters, 1872.
"	Robert Chalmers, Coloma.....	14	Brandy, vintage of 1870.
"	Robert Chalmers, Coloma.....	14	Brandy, vintage of 1871.
"	Robert Chalmers, Coloma.....	14	Brandy, vintage of 1872.
"	Robert Chalmers, Coloma.....	14	Brandy, vintage of 1873.

SEVENTH DEPARTMENT.

CLASS I—FINE ARTS.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	Miss H. M. Brooks, Sacramento...	1	Five crayon portraits.
"	Miss H. M. Brooks, Sacramento...	1	Six colored photographs.
"	Miss H. M. Brooks, Sacramento...	1	One painting in water colors.
"	Mrs. J. H. Lewis, Sacramento.....	2	Six oil paintings.
"	Mrs. J. F. McDorman, Sacramento	3	Statuary, etc., in plaster.
Sept. 21...	Mrs. H. D. Nash, Sacramento.....	4	One crayon picture.
"	Al. Smith, Sacramento.....	5	Eight frames of photographs.
"	Mrs. M. E. Hayden, Sacramento..	6	Six oil paintings.
"	Mrs. M. E. Hayden, Sacramento..	7	One landscape.
"	George Wilson, Sacramento.....	8	Four pencil drawings.
"	William Yule, Sacramento.....	9	One water color painting.
"	William Yule, Sacramento.....	9	One oil painting.
"	Miss Emily Thompson, Sacramento	10	One water color painting.
"	C. C. Brown, Sacramento.....	11	Nine pieces ornamental penmanship.
"	Mrs. George D. Stewart, Sacramento	12	Four water color paintings.
"	Mrs. George D. Stewart, Sacramento	12	Four crayon drawings.
"	H. S. Beals, Sacramento.....	13	One frame colored photographs.
"	H. S. Beals, Sacramento.....	13	One frame plain photographs.
"	Norton Bush, San Francisco.....	14	Eleven oil paintings.
"	Mrs. E. D. Kimball, San Francisco	15	One water color painting—Gladiolus.
"	Miss A. J. Perry, Sacramento.....	16	Nine oil paintings.
"	E. C. Atkinson, Sacramento.....	17	Three pieces penmanship.
"	Mansfield, Wing & Co., Sacramento	18	Three oil paintings.
"	Mansfield, Wing & Co., Sacramento	18	Twenty-four chromos.
"	Mansfield, Wing & Co., Sacramento	18	Two steel engravings.
"	Mrs. O. H. Wing, Sacramento.....	19	One stencil and oil painting.
"	Mrs. George Cox, Sacramento.....	20	One crayon picture.
"	F. Jay Lewis, Sacramento.....	21	Eleven oil paintings.
"	F. Jay Lewis, Sacramento.....	21	One pen drawing.
Sept. 23...	W. R. Strong, Sacramento.....	22	Three Chinese paintings (copies of photographs).
Sept. 22...	D. W. Crabb, Sacramento.....	23	One oil painting.
Sept. 21...	P. J. Hopper, Sacramento.....	24	Two monochromatic drawings.

CLASS II.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	F. E. Davis, Sacramento.....	1	One frame Masonic emblems, in marble .....
"	F. E. Davis, Sacramento.....	1	One frame Odd Fellows' emblems, in marble.

MISCELLANEOUS ARTICLES.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	Mrs. R. W. Murphy, Sacramento.	1	Artificial and natural feathers.
"	Ham. C. Harrison, Sacramento....	2	One rustic cone table.
"	P. R. Kessner, Sacramento.....	3	One case confectionery.
"	P. R. Kessner, Sacramento.....	3	Three confectionery pictures.
"	E. C. Atkinson, Sacramento.....	4	One pen drawing.
"	E. C. Atkinson, Sacramento.....	4	Four pieces business penmanship.
"	E. C. Atkinson, Sacramento.....	4	One piece ornamental penmanship.
"	E. C. Atkinson, Sacramento.....	4	One case card writing.
"	Mrs. J. R. Quinn, Sacramento.....	5	Two hanging sachet bags.
"	Mrs. J. R. Quinn, Sacramento.....	5	One basket, made from the milk of figs, in Portugal.
"	Mrs. Idiens, Sacramento.....	6	One wax picture frame.
"	Mrs. Idiens, Sacramento.....	6	One leathern bracket.
"	Mrs. Idiens, Sacramento.....	6	One wreath artificial flowers.
Sept. 20...	Dr. B. F. Lyford, San Francisco..	7	Process of ventilating and disinfecting charnel vaults.
"	Dr. B. F. Lyford, San Francisco..	7	Embalming process.
"	Dr. B. F. Lyford, San Francisco..	7	Model for patent oyster propagator, and nursery for propagating and nursing Eastern and foreign oysters.
"	H. C. Megerle, Sacramento.....	8	Process for embalming birds.
"	Stewart & Hamilton, Sacramento..	9	One door, painted in parti-colors on one side and grained on the other.
"	Mrs T. D. Ball, Sacramento.....	10	Two jars gooseberries, preserved in alcohol.
"	P. R. Kesner, Sacramento.....	11	Two confectionery pictures.
"	Henry Fisher, Sacramento.....	12	Two cases confectionery.
"	Henry Fisher, Sacramento.....	12	Twenty-four jars candy.
"	Mrs. M. Hoover, Elk Grove.....	13	Nine varieties of candied fruits.
"	Mrs. M. Hoover, Elk Grove.....	14	One silver tree; one lead tree; one tin tree.
"	Mrs. H. Cronkite, Sacramento.....	15	Two jars pear syrup.
"	Mrs. Leland Howe, Sacramento...	16	One scrap book.
"	R. S. Thompson, Napa	17	Adam's Chart of History.
"	C. H. Allmond, Sacramento.....	18	Collection of California birds' eggs.
"	C. H. Allmond, Sacramento.....	19	One newspaper, printed in the year eighteen hundred.
"	C. H. Allmond, Sacramento.....	19	Collection of ancient coins.
"	Mrs. E. M. Wilson, Sacramento...	20	One pair blankets, woven and spun by a lady sixty-five years of age.
"	Mrs. E. M. Wilson, Sacramento...	20	One bedspread, woven and spun by a lady sixty-five years of age.

MISCELLANEOUS ARTICLES—Continued.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
Sept. 20...	Joseph Purington, Sacramento.....	21	Six varieties crystallized fruit.
"	Miss Sarah Abbey, San Francisco..	22	Grand Excelsior American Chart, for dress cutting.
Sept. 21...	W. F. Sherwood, San Francisco...	23	One Utility adjustable table.
Sept. 23...	Daniel McCarty, Sacramento.	24	One pair Irish thrushes.
Sept. 21...	J. Linde, San Francisco.....	25	One case fancy shellwork.
Sept. 19...	A. Menke, Sacramento.....	26	One fancy baby carriage (La Bon Ton), English pattern, patented August 25th, 1874.
"	A. Menke, Sacramento.....	26	One fancy baby carriage (La Bon Ton), American pattern, patented August 25th, 1874.

JUVENILE DEPARTMENT.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
1874.			
Sept. 19...	Miss Margaret R. Arnold (ten years), Sacramento.....	1	One gentleman's shirt.
Sept. 21...	Miss Kitty Van Voorhees (twelve years), Sacramento.....	2	One pair mats; one toilet set.
"	Miss Belle Knox (eleven years), Sacramento.....	.....	Two worsted tidies.
"	Miss Eva K. Hadley, Sacramento.	3	One worsted tidy.
"	Miss Eva K. Hadley, Sacramento.	4	Three crochet tidies; one toilet set, Java canvas; one tidy, Java canvas; one tidy, railroad canvas.
"	Miss Emily Thompson, Sacramento..	5	Moss work; one frame-made tidy.
"	Miss Pauline Morrill (thirteen years), Sacramento.....	6	One card receiver; lace tidies; decalcomaine picture.
"	Miss Grace Morrill (twelve years), Sacramento.....	7	Work box; catchall; decalcomaine picture.
"	Miss Katie Jackson, Elk Grove....	.....	One log cabin quilt.
"	Miss Nancy Jackson, Elk Grove...	.....	One log cabin quilt.
"	Miss Emma M. Hartwell (eleven years), Sacramento.....	.....	Child's dress, made by hand.
"	Miss Kittie Allmond, Sacramento.	8	Four monochromatic drawings; shell and marble vase; one piece penmanship.
"	Miss Minnie McNiel, (six years), Sacramento.....	.....	Two tidies; one lot fancy articles.
"	Miss Mary H. Moore (twelve years), Sacramento	9	One medley picture.
"	Miss Mary Rogers, Watsonville...	10	One mohair opera cloak; one mohair wreath.
"	Miss Mary Heilbron (six years), Sacramento.....	11	One crochet tidy.

JUVENILE DEPARTMENT—Continued.

Date.	Name and Post Office address of exhibitor.	No. Entry.	Article.
Sept. 21...	Miss Carrie E. Usher (seventeen years), San Francisco	12	One pen picture.
"	Miss Nellie Dunlap (twelve years), Sacramento	13	One pencil drawing.
"	Miss Eloise Marvin (twelve years), Sacramento	14	Child's embroidered dress; five toilet mats.
"	Miss Nellie Lansing (eleven years), Sacramento	15	One lot dried fruit—apples, pears, and peaches.
"	Miss Mary H. Moore (twelve y'rs), Sacramento	16	Two worsted toilet cushions.

PREMIUMS AWARDED IN 1874.

PREMIUM LIST OF STATE FAIR FOR 1874.

FIRST DEPARTMENT.

LIVE STOCK.

THOROUGHBRED HORSES.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Stallions.				
Best stallion, four years old and over	Theo. Winters	Solano	Norfolk	$75
Best stallion, three years old and over	John Hall	Alvarado	Woodbury	$50
Best stallion, two years old and over	Wm. Boots	San José	N. Coombes	$40
Best stallion, one year old and over	Wm. Boots	San José	Bob Wooding	$30
Best stallion, colt under one year	Theo. Winters	Solano	No. 1	$20
Mares.				
Best mare, four years old and over, with colt	Theo. Winters	Solano	Hennie Farrow and colt	$60
Best mare, four years old and over	John Hall	Alvarado	Peggy Ringgold	$50
Best mare, three years old	J. C. Simpson	Oakland	Marion	$40
Best mare, two years old	None			
Best mare, one year old	Theo. Winters	Solano	Mollie McCarty	$25
Best mare colt under one year	John Hall	Alvarado	No name	$20

THOROUGHBRED HORSES—Continued.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Families.				
Best thoroughbred sire, with not less than ten of his colts	Theo. Winters	Solano	Norfolk and ten of his colts	$150
Best thoroughbred dam, with not less than four of her colts			Moss Rose and Hennie Farrow and colts.	$100
Best stallion, other than thoroughbreds, with not less than ten colts.	D. M. Reavis	Chico	Blackbird and colts	$100
One stallion and ten colts	Wm. Hamilton	San José		Special $100
Best dam, other than thoroughbred, with not less than three colts	Wm. Hamilton	San José	Santa Clara and colts	$50

GRADED HORSES.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Stallions.				
Best stallion, four years old and over	J. D. Carr	Gabilan	Carr's Mambrino	$50
Best stallion, three years old	None			
Best stallion, two years old	Theo. Winters	Solano	Scamperdown	$30
Best stallion, one year old	E. H. Miller	Sacramento	Blackbird	$20
Best stallion colt under one year	None			
Mares.				
Best mare, four years old and over	D. P. Diggs	Yolo	Minnie Ball	$40
Best mare, four years old and over, with colt	Wm. Hamilton	San José	Winona and colt	$50
Best mare, three years old	D. M. Reavis	Chico	Flora	$30
Best mare, two years old	Wm. Hamilton	San José	Emma	$20
Best mare, one year old.	D. M. Reavis	Chico	Nellie	$15

HORSES OF ALL WORK.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Stallions.				
Best stallion, four years old and over	J. J. Bell	Shasta County	Duke	$40
Best stallion, three years old	Wm. Hamilton	San José	Justice	$30
Best stallion, two years old	John Henry	Yolo	Henry Ward Beecher	$20
Best stallion, one year old	W. A. Findley	Wheatland	Billy	$15
Mares.				
Best mare, four years old and over, with colt	Carl Halverson	Pattersons	Belle and colt	$40
Best mare, four years old and over	Jas. McComb	Dixon	Solano Maid	$30
Best mare, three years old	E. Pierce	Sacramento	Lucy Moore	$20
Best mare, two years old	Mark Hopkins	Sacramento	Belle	$15
Best mare, one year old	None			

DRAFT HORSES.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Stallions.				
Best stallion, four years old and over	C. Hubbard	Sacramento	Wm. Wallace	$40
Best stallion, three years old	McCarty & Lupham	San Francisco.	Judge Templeton	$30
Best stallion, two years old	William E. McCracken	Freeport	George	$20
Best stallion, one year old	John Gosling	Sacramento	Prince June	$15
Mares.				
Best mare, four years old and over, with colt	John Neal	Sacramento	Eliza and colt	$40
Best mare, four years old and over	Chris. Thodt	Dixon	Kate	$35
Best mare, three years old	W. B. Gibson	Woodland	Betsy	$25
Best mare, two years old	Chris. Thodt	Dixon	Lucy	$20
Best mare, one year old	None			

ROADSTERS.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Stallions.				
Best stallion, four years old and over	S. Eaton	Marysville	Cal. Dexter	$50
Best stallion, three years old	Wm. Hamilton	San José	Honest Allen	$40
Best stallion, two years old	Wm. Hamilton	San José	Frank Malone	$30
Best gelding, four years old and over	C. F. Jones	Marysville	Ben. Wade	$40
Best gelding, three years old	D. R. Hunt		Pat. Hunt	$20
Mares.				
Best mare, four years old and over	J. Sessions	Oakland	Y'ng Diamond.	$40
Best mare, three years old	John Munson	San Francisco.	Patchen Queen.	$30
Best mare, two years old	Leland Stanford	Sacramento	Gilberte	$20

CARRIAGE HORSES.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Best matched span	W. A. Matthews.	San José	No. One and mate	Sil. gob. $40

TEAM ROADSTERS.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Best roadster team	Wm. B. Carr	San Francisco.	Brown Billy and mate	$40

SADDLE HORSES.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Best saddle horse	M. Biggs	Butte County.	Wild Bill	Saddle, $40

COLTS.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Best yearling horse colt.	Wm. Hamilton...	San José.....	Black Allen	.....$30
Best sucking horse colt.	S. Eaton.....	Marysville	Mike Nye	.....$20
Best yearling mare colt.	Adam Newbauer.	Sacramento.....	Daisy Donner...	.....$20
Best sucking mare colt..	Carl Halverson...	Pattersons	Queen	.....$15
Best exhibit of not less than six colts, owned by one person.....	Wm. Hamilton...	San José.....	Six Ethan Allen colts.....	.....$50

SWEEPSTAKES.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Best stallion, of any age	Theo. Winters.....	Solano.....	Norfolk.....	.....$100
Second best stallion, of any age.....	John Boggs.....	.....	Langford	.....$50
Best mare, of any age..	Theo. Winters.....	Solano	Hennie Farrow.	.....$75
Second best mare, of any age.....	John Hall.....	.....	Peggy Ringgold	....$35
Best graded mare, four years old and over....	George Bemont...	....	Amelia	Special premium ree.
Best jack, four years old and over.....	M. Biggs	Butte County..	Humboldt.....	.....$40
Best jennet, four years old and over	Thos. Edwards....	Sacramento.....	Julia	.....$30
Best jennet, three years old.....	Thos. Edwards....	Sacramento.....	Nancy.....	.....$20

CATTLE.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Durham.				
Best bull, four years old and over	D. M. Reavis	Chico.....	Stonewall	.....$60 00
Second best bull, four years old and over.....	Jeff. Bridgford....	Missouri.....	Muscovite	.....$30 00
Best bull, three years old	H. J. Glenn.....	Jacinto	General Grant...	.....$30 00
Second best bull, three years old.....	C. Younger.....	San José.....	Tempest.....	.....$15 00
Best bull, two years old	D. M. Reavis	C ico.....	Duke of Liberty	.....$20 00
Second best bull, two years old.....	Jones & Co.....	San José.....	Mast'r Maynard	.....$10 00
Best bull, one year old..	Jones & Co.....	San José.....	Mason Duke.....	.....$15 00
Second best bull, one year old.....	Jeff. Bridgford....	Missouri.....	Cornell	.....$7 50
Best bull calf....	C. Younger.....	San José.....	Arthur Lemon.	.....$10 00
Second best bull calf....	Jeff. Bridgford....	Missouri.....	Bourbon Duke..	....$5 00

CATTLE—Continued.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Best cow, four years old and over	Jeff. Bridgford	Missouri	Jennie McLean	$40 00
Second best cow, four years old and over	C. Younger	San José	Sprightly	$20 00
Best cow, three years old	Jeff. Bridgford	Missouri	Ellen 3d	$30 00
Second best cow, three years old	Jones & Co.	San José	Lorena 2d	$15 00
Best cow, two years old	Jeff. Bridgford	Missouri	Cora Lee	$20 00
Second best cow, two years old	C. Younger	San José	Valley Maid	$10 00
Best cow, one year old	Jeff. Bridgford	Missouri	Lady Meldon	$15 00
Second best cow, one year old	Jeff. Bridgford	Missouri	Delia Bridgford	$7 50
Best heifer calf	M. Wick	Oroville	Gem	$10 00
Second best heifer calf	Jeff. Bridgford	Missouri	Medora	$5 00
Devon.				
Best bull, four years old and over				
Best bull, three years old	Seneca Daniels	Sonoma	Duke	$30 00
Best bull, two years old				
Best bull, one year old				
Best bull calf	Seneca Daniels	Sonoma	Beecher	$10 00
Second best bull calf	Seneca Daniels	Sonoma	Tilton	$5 00
Best cow, four years old and over	Seneca Daniels	Sonoma	Fairy	$40 00
Best cow, three years old				
Best cow, two years old	Seneca Daniels	Sonoma	Fancy	$20 00
Best cow, one year old				
Best heifer calf				
Second best cow	Seneca Daniels	Sonoma	Fashion	$20 00
Alderney.				
Best bull, four years old and over	Robert Beck	Sacramento	Touchstone	$60
Second best bull, four years old and over	L. C. Powers	Sacramento	Saratoga	$30
Best bull, three years old				
Best bull, two years old				
Best bull, one year old	W. J. Prather	Woodland	Bismarck	$15
Best bull calf	A. Mailliard	San Rafael	Young Comet	$10
Second best bull calf	A. Mailliard	San Rafael		$5
Best cow, four years old and over	A. Mailliard	San Rafael	Cora	$40
Best cow, three years old	A. Mailliard	San Rafael	Annie	$30
Best cow, two years old	A. Mailliard	San Rafael	Romona	$20
Best cow, one year old	A. Mailliard	San Rafael	Lady Bowen 4th	$15
Best heifer calf	A. Mailliard	San Rafael	Romona 2d	$10
Ayrshire.				
Best bull, two years old	Robert Beck	Sacramento	Lord Clyde	$20
Best bull, one year old	Robert Beck	Sacramento	Major Wentworth	$15
Best cow, four years old and over	Robert Beck	Sacramento	Kittie Clyde	$40

CATTLE—Continued.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Second best cow, four years old and over	L. A. Upson	Sacramento	Flora McIvor	$20
Best cow, one year old.	L. A. Upson	Sacramento	Bonnie Jean	$15
Jersey.				
Best bull, four years old and over	J. B. Haggin	San Francisco.	Dashwood	$60
Best bull, two years old.	A. Mailliard	San Rafael	Keystone	$20
Best bull, one year old	L. C. Powers	Sacramento	Volunteer	$15
Second best bull, one year old	J. B. Haggin	San Francisco.	Billy Dashwood	$7 50
Best bull calf	J. B. Haggin	San Francisco.	Hero	$10
Second best bull calf	A. Mailliard	San Rafael	Florian	$5
Best cow, four years old and over	L. J. Orcutt	Cummington, Mass.	Blanche	$40
Second best cow, four years old and over	L. C. Powers	Sacramento	Daisy Eyebright	$20
Best cow, three years old and over	J. B. Haggin	San Francisco.	Nelly Bly	$ 0
Second best cow, three years old and over	J. B. Haggin	San Francisco.	Ma ia	$15
Best cow, two years old.	A. Mailliard	San Rafael	Floradell	$20
Second best cow, two years old	J. B. Haggin	San Francisco.	Lillie Hudson	$10
Best cow, one year old.	L. J. Orcutt	Cummington, Mass.	Ruby	$15
Second best cow, one year old	L. C. Powers	Sacramento	Cherry	$7 50
Best heifer calf	J. B. Haggin	San Francisco.	Inez	$10
Second best heifer calf	A. Mailliard	San Rafael	Lady Jane 3d	$5
Holstein.				
Best bull, four years old and over	S. B. Emerson	Mountain View	Opidus	$60
Herds—One male and five females.				
Best herd of not less than six cattle	Carr & Chapman.	Gabilan	Gov. Booth and herd	Silver pitcher—$150
Second best herd thoroughbred cattle	Jones & Co	San José	Monitor Maynard and herd	$75
Second best bull, three years old, graded	Charles Green	Rio Vista	Duke	$10
Second best bull, one year old, graded	H. Hamel.	Solano	Bolingbroke	$7 50
Second best cow, three years old, graded	E. Comstock	Yolo	Spark	$10
Second best cow, one year old, graded	S. B. Emerson	Mountain View	Fairy Queen	$5
Graded.				
Best bull, four years old and over				
Best bull, three years old	C. P. Hensley	Rio Vista	Major	$20 00
Best bull, two years old	E. Comstock	Yolo	Granger	$15 00
Best bull, one year old	H. Hamel	Solano	Grenadier	$10 00
Best bull calf	E. Comstock	Yolo	Mike	$5 00
Second best bull calf	E. Comstock	Yolo	Laddie	$2 50

CATTLE—Continued.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Best cow, four years old and over	E. Comstock	Yolo	Chub	$30 00
Best cow, three years old	Chas. Clarke	San José	Mollie	$20 00
Best cow, two years old	E. Comstock	Yolo	Blanche	$15 00
Best cow, one year old.	E. Comstock	Yolo	May Queen	$10 00
Best heifer calf	Chas. Clarke	San José	Mollie 1st	$10 00
Second best heifer calf	E. Comstock	Yolo	Lady Tilton	$5 00
Sweepstakes.				
Best bull of any age or stock	S. B. Emerson	Mount'n View.	Sheriff	Sil. pitcher, $100
Second best bull of any age or stock	Jeff. Bridgford	Missouri	Muscovite	Sil. pitcher, $75
Best cow of any age or stock	Carr & Chapman.	Gabilan	Lady Solway	Sil. pitcher, $75
Second best cow of any age or stock	C. Younger	San José	Sprightly	Sil. pitcher, $35
Best bull, and five of his calves under one year	C. Younger	San José	Thorndale	Sil. pitcher, $100
Second best bull, and five of his calves under one year	M. Wick	Oroville	Red Cloud	Sil. pitcher, $50

SHEEP.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Spanish Merino.				
Best ram, two years old and over, first premium	Severance & Peet.	Niles Station	Green Mountain	$30
Best ram, two years old and over, second premium	Severance & Peet.	Niles Station	California Chief	$15
Best ram, one year old and under two, first premium	Hammond & Co.	Vermont	No. 1	$20
Best ram, one year old and under two, second premium	Hammond & Co.	Vermont	No. 2	$10
Best three ram lambs, first premium	Fred. Cox	Sacramento	Pen three ram lambs	$20
Best three ram lambs, second premium	Severance & Peet.	Niles Station	Pen three ram lambs	$10
Best pen five ewes, two years old and over, first premium	Severance & Peet.	Niles Station	Pen of five ewes	$20
Best pen five ewes, two years old and over, second premium	Severance & Peet.	Niles Station	Pen of five ewes	$10
Best pen five ewes, one year old and under, first premium	Severance & Peet.	Niles Station	Pen of five ewes	$20

SHEEP—Continued.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Best pen five ewes, one year old and under, second premium	Severance & Peet.	Niles Station	Pen of five ewes	$10
Best pen of five ewe lambs, first premium	Severance & Peet.	Niles Station	Pen of five ewe lambs	$20
Best pen of five ewe lambs, second premium	Severance & Peet.	Niles Station	Pen of five ewe lambs	$10
Best ram and five of his lambs, first premium	Severance & Peet.	Niles Station	Bigleg, and five of his lambs	$30
Best ram and five of his lambs, second premium				
French Merino.				
Best ram, two years old and over, first premium	Wm. Blacow	Alameda County	Gamester	$30
Best ram, two years old and over, second premium	R. A. Brampton	Dixon	Napoleon	$15
Best ram, one year old and under two, first premium	Wm. Blacow	Alameda County	Sultan	$20
Best ram, one year old and under two, second premium	R. A. Brampton	Dixon	Rufus	$10
Best three ram lambs, first premium	Murray & Watt	Sacramento	Pen of three	$20
Best three ram lambs, second premium	Wm. Blacow	Alameda County	Pen of three	$10
Best pen five ewes, two years old and over, first premium	Wm. Blacow	Alameda County	Pen of five	$20
Best pen five ewes, two years old and over, second premium	R. A. Brampton	Dixon	Pen of five	$10
Best pen five ewes, one year old and under two	Wm. Blacow	Alameda County	Pen of five	$20
Best pen of five ewe lambs, first premium	Murray & Watt	Sacramento	Pen of five ewe lambs	$20
Best pen of five ewe lambs, second premium	Wm. Blacow	Alameda County	Pen of five ewe lambs	$10
Best ram and five of his lambs	Wm. Blacow	Alameda County	Gamester, and five lambs	$30
Cotswold.				
Best ram, two years old and over	S. B. Emerson	Mountain View	Link	$30
Best ram, one year old and under two	Landrum & Rogers	Watsonville	Prince, Jr.	$20
Best three ram lambs	Landrum & Rogers	Watsonville	Three ram lambs	$20
Best pen five ewes, two years old and over	Landrum & Rogers	Watsonville	Five ewes	$20
Second best pen five ewes, two years old and over	S. B. Emerson	Mountain View	Five ewes	$1

SHEEP—Continued.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Best ram and five of his lambs	S. B. Emerson	Mountain View	Link, and five lambs	$20
Best pen of five ewe lambs	S. B. Emerson	Mountain View	Five ewe lambs	$20
Shropshire.				
Best ram, two years old and over	L. Pierce	Suisun	Jack	$30
Best pen of five ewes, two years and over.	L. Pierce	Suisun	Five ewes	$20
Best ram and five of his lambs	L. Pierce	Suisun	Jack and five lambs	$30
Southdown.				
Best ram, two years old and over	Geo. Bemont	Napa	One buck	$30
Second best ram, two years and over	J. D. Carr	Gabilan	Fordham	$15
Best ram, one year old and under two				
Best pen of five ewes, two years old and over	Geo. Bemont	Napa	Five ewes	$20
Second best pen of five ewes, two years old and over	J. D. Carr	Gabilan	Five ewes	$10
Best pen of five ewes, one year old and under two	Geo. Bemont	Napa	Five ewes	$20
Best pen of five ewe lambs	Geo. Bemont	Napa	Five ewe lambs	$20
Second best pen of five ewe lambs	J. D. Carr	Gabilan	Five ewe lambs	$10
Best three ram lambs.	Geo. Bemont	Napa	Five ram lambs	$20
Second best three ram lambs	J. D. Carr	Gabilan	Five ram lambs	$10
Best ram and five of his lambs	J. D. Carr	Gabilan	Fordham and five lambs	$30
Second best ram and five of his lambs				
Best Leicestershire ram, two years and over	J. D. Carr	Gabilan	Lord Leicester	$30
Best Silesian ram, two years old and over	S. Treat	Sacramento	Longfellow	$30
Second best Silesian ram, two years old and over	Murray & Watt	Sacramento	Damifino	$15
Graded.				
Best ram, two years old and over	J. H. Glide	Sacramento	Goodfleece	$25
Best ram, one year old and under two	G. W. Hancock	Sacramento	Whitney	$15
Best pen of five ewes, one year old and under two	S. Treat	Elk Grove		$20
Best five ram lambs	R. A. Brampton	Dixon	Pen of five	$20
Best pen of five ewes, two years old and over	R. A. Brampton	Dixon	Pen of five ewes	$20

SHEEP—Continued.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Second best pen of five ewes, two years old and over				
Graded.				
Best pen of five ewes, one year old and under two	R. A. Brampton	Dixon	Pen of five ewes	$15
Second best pen of five ewes, one year old and under two				
Best pen of five ewe lambs	G. W. Hancock	Sacramento	Pen of five ewe lambs	$15
Second best pen of five ewe lambs				
Sweepstakes.				
Best ram of any age or breed	Severance & Peet.	Niles Station		$75
Second best ram of any age or breed	M. Blacow	Alameda Co.	Gamester and five lambs	$35

Committee recommend special premium to S. Treat for cross.

GOATS.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Angora.				
Best buck, two years old and over	N. Gilmore	El Dorado	Hannibal	$40 00
Second best buck, two years old and over	Landrum & Rogers	Watsonville	Tommy	$25 00
Best buck, under two years	Landrum & Rogers	Watsonville	Hercules 87	$30 00
Second best buck, under two years	J. P. Sargent	Gilroy	Aladdin	$20 00
Best pen of three does, two years and over	N. Gilmore	El Dorado	Pen of three	$25 00
Second best pen, three does, two years and over	C. P. Bailey	San José	Pen of three	$15 00
Best pen of three does, under two years	Landrum & Rogers	Watsonville	Pen of three	$20 00
Second best pen, three does, under two y'rs.	N. Gilmore	El Dorado	Pen of three	$10 00

GOATS—Continued.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Graded.				
Best pen of three does, two years old and over	J. P. Sargent	Gilroy	Pen of three	$20 00
Sweepstakes.				
Best buck, first premium	N. Gilmore	El Dorado	Han ibal	$50 00
Best buck, second premium	Landrum & Rogers	Watsonville	Hercules 87	$30 00
Best does, first premium	N. Gilmore	El Dorado	Pen of does	$25 00
Best does, second premium	Landrum & Rogers	Watsonville	Pen of does	$15 00
Best pen of not less than ten kids	Landrum & Rogers	Watsonville	Pen of ten kids	$ 0 00
Second best pen of not less than ten kids	J. P. Sargent	Gilroy	Pen of ten kids	$15 00

SWINE.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Best boar, two years old and over	R. S. Thompson	Napa	Young Comet	$30 00
Best boar, under two years	R. S. Thompson	Napa	Souse Genteel	$20 00
Best boar, six months and under one year	R. S. Thompson	Napa	Washoe	$15 00
Best breeding sow, two years old and over	J. C. Mills	Centreville	Princess	$25 00
Best breeding sow, one year old	E. A. Bridgford	Colusa	Kitty Thomps'n	$25 00
Best sow, six months and under one year	R. S. Thompson	Napa	Berkshire Beauty	$10 00
Best pair of pigs, from six to ten months old	R. S. Thompson	Napa	Pair of pigs	$30 00
Best pen of ten pigs, any age or breed	E. J. Sparks	Lincoln	Pen of ten pigs	$30 00
Sweepstakes.				
Best boar, of any age or breed	E. A. Bridgford	Colusa	Berkshire Boy	$40 00
Second best boar, of any age or breed	W. P. A. Craig	Rye Patch, Nev.	Sucker Boy	$25 00

POULTRY.

Animals.	Exhibitors.	Residence.	Names.	Premiums.
Best lot Light Bramahs...	Bassett & Miller..	Sacramento...	.....	.....$5
Best lot Black Spanish.....	F. S. George.....	Sacramento...	.....	..... $5
Best lot Black Polands.....	Peter Burns	Sacramento...	.....	.....$5
Best lot Black-red Games.	Bassett & Miller..	Sacramento...	.....	.....$5
Best lot Bronze turkeys ...	W. J. Prather.....	Woodland	.....	.....$5
Best lot turkeys, any other variety.....	J. C. Mills.....	Centreville....	Narragansett Turkeys.....	.....
Best lot Duck-wing Game Bantams.....	Bassett & Miller..	Sacramento...	.....	..... $5
Best lot Houdans.....	John F. Friggins.	Woodland.....	.....	.....$5
Best three lots of Buff Cochins	W. J. Prather.....	Woodland	.....	.....$5
Best lot White Cochins....	W. J. Prather.....	Woodland	....	.....$5
Best lot Black Cochins.....	W. J. Prather.....	Woodland	.....	.....$5
Best lot Partridge Cochins	W. J. Prather.....	Woodland	....	.....$5
Best lot White Polands....	W. J. Prather.....	Woodland	.....	.....$5
Best lot Bearded Golden Polands.....	W. J. Prather.....	Woodland	.....	.....$5
Best lot Golden Seabright Bantams	W. J. Prather.....	Woodland	.....	.....$5
Best lot Black Javas.....	C. H. Theiss.....	Sacramento...	.....	.....$5
Best lot Golden Spangled Hamburg.....	J. B. White.....	Sacramento...	.....	.....$5
Best lot Silver Spangled Hamburg.....	Jerome Davis.....	Sacramento...	.....	.....$5
Best lot Frizzled Fowls....	H. Greer.....	Sacramento...	.....	.....$5
Best lot Dominique.....	R. Cowne.....	Sacramento...	.....	.....$5
Best lot Asiatic Chicks.....	Bassett & Miller..	Sacramento...	.....	.....$5
Best lot Silver Duck-wing Game Bantams.....	Bassett & Miller..	Sacramento...	.....	.....$5
Best lot Black-red Game Bantams	Bassett & Miller..	Sacramento...	.....	.....$5
Best lot Dark Bramahs....	John Herring.....	Sacramento...	.....	.....$5
Best lot White Leghorns..	M. Butler.....	Sacramento...	.....	.....$5
Sweepstakes.				
Best exhibit.....	Bassett & Miller..	Sacramento...	.....	.....$15
Best lot of ducks.....	W. J. Prather.....	Woodland	Rouen	.....$5
Best lot of gray geese	A. B. Gilbert.....	.....	.....	.....$5

SECOND DEPARTMENT.

CLASS I—MACHINERY, ENGINES, ETC.

Exhibitor.	Post Office.	Article.	Premium.
J. M. Keeler & Co.....	San Francisco..	One Kipp engine.....	Hon. mention and diploma.
Huntington, Hopkins & Co.....	Sacramento.....	One saw gummer.....	.....$2
George R. Grant.....	.....	Best fire extinguisher.....	..... Diploma.
Treadwell & Co.....	San Francisco..	Portable steam engine.....	..... Diploma.
Treadwell & Co	San Francisco..	Best imported engine.....	..... Diploma.
Baker & Hamilton.....	Sacramento.....	Best display of general machinery.....	Gold medal rec.

CLASS II.

Exhibitor.	Post Office.	Article.	Premium.
Huntington, Hopkins & Co.....	Sacramento.....	One lawn mower.....	..... Diploma.
Huntington, Hopkins & Co.....	Sacramento.....	One gopher trap.....	.....$5
Huntington, Hopkins & Co.....	Sacramento.....	One post-hole augur.....	.... Diploma.
Huntington, Hopkins & Co.....	Sacramento.....	One vegetable cutter	..... Diploma.
Huntington, Hopkins & Co.....	Sacramento.....	One lawn sprinkler.....	.....$5
Baker & Hamilton.....	Sacramento.....	Thrashing machine, "Pitt's Buffalo".....	
Baker & Hamilton.....	Sacramento.....	Cider mills and press.....	
Baker & Hamilton.....	Sacramento.....	Lock-lever hay and grain rake.....	
Baker & Hamilton.....	Sacramento.....	Four hay and straw cutters	.....First premium.
Baker & Hamilton.....	Sacramento.....	Two corn shellers.....	
Baker & Hamilton.....	Sacramento.....	Two lawn mowers.....	
Baker & Hamilton.....	Sacramento.....	One lawn sprinkler.....	
Baker & Hamilton.....	Sacramento.....	One Champion post-hole augur.....	
Baker & Hamilton.....	Sacramento.....	One header (California manufacture).....	
Baker & Hamilton.....	Sacramento.....	Gew's broadcast seed sower	
Baker & Hamilton.....	Sacramento.....	Sweepstake harrows.....	
Baker & Hamilton.....	Sacramento.....	Grange cultivator.....	
Baker & Hamilton.....	Sacramento.....	Wrought iron cultivator.....	.....First premium.
Baker & Hamilton.....	Sacramento.....	Sweepstake road scraper.....	
Baker & Hamilton.....	Sacramento.....	Eureka & Sweepstake gang plows.....	
Baker & Hamilton	Sacramento.....	Spring, market, and road wagons.....	

CLASS II—Continued.

Exhibitor.	Post Office.	Article.	Premium.
Baker & Hamilton	Sacramento	Buckeye cider mill and press.	Diploma.
M. C. Hawley & Co	Sacramento	Buckeye cider mill and press.	Diploma.
Baker & Hamilton	Sacramento	Horse rake	Diploma.
Keller & Co	Sacramento	Straw cutter, "Continental."	Diploma.
Keller & Co	Sacramento	Hay press, "Eagle" (California manufacture)	$10
Keller & Co	Sacramento	Circular saw (mill)	Diploma.
Laufkotter Brothers	Sacramento	Sweep horse-power	$10
Baker & Hamilton	Sacramento	Corn shellers, "St. Louis"	Diploma.
Baker & Hamilton	Sacramento	Lawn mower	Diploma.
Byron Jackson		Self-feeder and elevator	$50
M. C. Hawley & Co	Sacramento	Thrashing machine	Diploma.

CLASS III.

Exhibitor.	Post Office.	Article.	Premium.
Baker & Hamilton	Sacramento	Sweepstake Plow Company's headers	$50
W. Guttenberger	Sacramento	Field roller and crusher	$10
Baker & Hamilton	Sacramento	Sweepstake Plow Company's harrows	$50
M. C. Hawley & Co	Sacramento	Two-horse broadcast sowing machine	Diploma.
Keller & Co	Sacramento	Broadcast seed sower and cultivator	Diploma.
Baker & Hamilton	Sacramento	Self-raking and reaping machines	Diploma.
Baker & Hamilton	Sacramento	Sweepstake Plow Company's broadcast sowing machine, "Gem"	$10
Baker & Hamilton	Sacramento	Buckeye reaping and mowing machine	Diploma.
Baker & Hamilton	Sacramento	One-horse cultivator	Diploma.
Mattison & Williamson		Cultivator, California manufacture	$10
Keller & Co	Sacramento	Double-shovel plow	Diploma.
Treadwell & Co	San Francisco	Headers of Eastern manufacture	Diploma.

CLASS IV.

Exhibitor.	Post Office.	Article.	Premium.
Baker & Hamilton	Sacramento	French burr stone farm feed mill	Diploma.
Nash, Miller & Co.	Sacramento	Grain separator and fanning mill	Diploma and $5
W. C. Nelson		Windmill	$25
A. Hart & Co.	Sacramento	Farm gate	$15
V. S. W. Parkhurst	San Francisco	Best scales, platform and counter	Silver medal.
John Wilkie	Sutter County	Machine for applying blue-stone to seed grain	Diploma.
H. M. Cameron	Chicago	Champion bee hive	Diploma.
H. M. Cameron	Chicago	Combined feeder and ventilator	
Huntington, Hopkins & Co.	Sacramento	Platform scales	Hon. mention.

CLASS V.

Exhibitor.	Post Office.	Article.	Premium.
J. M. Keeler & Co.	San Francisco	Sluthour pump	$20
Laufkotter Bros.	Sacramento	Double-acting deep well force pump	$20
Huntington, Hopkins & Co.	Sacramento	Farm road scraper	$5
Huntington, Hopkins & Co.	Sacramento	Cabbage cutter	$2
S. J. Whipple	Placer County	Rectangular churn	Diploma.
A. Parker	Hicksville	Crane's washing machine	$5
A. Callahan	San Francisco	"Complete Washer" washing machine	Hon. mention.
M. K. Barron	San Francisco	Double-acting washing machine	Diploma.
Baker & Hamilton	Sacramento	Sweepstake Plow Co.'s farm road scraper	$5
Keller & Co.	Sacramento	Best hay loader	$50—special.
Hawley & Co.	Sacramento	Churns	Diploma.
Laufkotter Bros.	Sacramento	Apparatus for raising water for irrigating purposes	$20
A. P. Smith	Sacramento	Step ladder for picking fruit	$5—special.
J. M. Keeler & Co.	San Francisco	Ryder's American fruit drier	Special prem.

CLASS VI.

Exhibitor.	Post Office.	Article.	Premium.
Baker & Hamilton	Sacramento	Sweepstake Plow Co.'s one-gang plow—best on exhibition	$100
C. Myers		Subsoil plow	$20
W. B. Ready	Sacramento	Stubble plow	$10
W. B. Ready	Sacramento	Gang plow	Diploma.
M. C. Hawley & Co	Sacramento	One "John Deere" gang plow	Diploma and special premium.
Treadwell & Co	San Francisco	Sod plow	$10
Hawley & Co	Sacramento	Sidehill plow	Diploma.
Hawley & Co	Sacramento	One-horse plow	Diploma.
Baker & Hamilton	Sacramento	Steel plow, "Scotch Clipper"	Diploma.
Baker & Hamilt n	Sacramento	Cast iron plow, "Monitor"	Diploma.

CLASS VII.

Exhibitor.	Post Office.	Article.	Premium.
Dan. Mason	Sacramento	Trotting wagon	$15 and diploma.
Doland & Co	Sacramento	One top wagon	Special premium.
Doland & Co	Sacramento	One phaeton	Special premium.
Doland & Co	Sacramento	One sulky	Special premium.
Huntington, Hopkins & Co	Sacramento	Assortment carriage material and trimmings	Diploma.
Huntington, Hopkins & Co	Sacramento	Carriage springs	$10
Carvill Manuf'g Co	San Francisco	One two-horse family carriage	$30
Carvill Manuf'g Co	San Francisco	One one-horse family carriage	$25
Carvill Manuf'g Co	San Francisco	One top buggy	$20
M. Kesler		Farm wagon for general purposes—California manufacture	$15
J. F. Hill	Sacramento	Thorough-brace market wagon — California manufacture	$15
Baker & Hamilton	Sacramento	Sweepstake Plow Co.'s street goods wagon	$5
Baker & Hamilton	Sacramento	Best imported farm wagon—Bain wagon	Diploma.
E. E. Ames	Sacramento	Best display carriage wheels	Diploma.
Keller & Co	Sacramento	Carriage or wagon brake	Diploma.
Jas. McRossi		Two-horse truck—California manufacture	$20—special.
J. F. Hill	Sacramento	Best two-horse family carriage	$30

THIRD DEPARTMENT.

CLASS I—TEXTILE FABRICS, AND MATERIALS FROM WHICH THEY ARE MADE.

Exhibitor.	Post Office.	Article.	Premium.
Joseph Green	Oakland	Best exhibit of silk goods by one factory	$25
Sacramento Woolen Mills	Sacramento	Best display of woolen goods by one factory	$100
Sacramento Woolen Mills	Sacramento	Best Mackinac blanket	$5
Alexander Mackay	San Francisco	Best ten yards rag carpet	$10
M. Kraker	Sacramento	Best display of shoulder braces and corsets	Silver medal.
M. Kraker	Sacramento	Best display of fancy goods	$20
Mrs. J. F. McDorman.	Sacramento	Best hearth rug	$5
Miss A. Hubbard	Sierra Valley	One hearth rug (beautiful in design)	Napkin ring.
Mrs. J. F. Hill	Sacramento	Five rag rugs (meritorious display)	Napkin ring.
Mrs. E. Riersman	Sacramento	Two rag rugs (very fine)	Napkin ring.

JUVENILE DEPARTMENT.

Exhibitor.	Post Office.	Article.	Premium.
Miss M. R. Arnold (eleven years old)	Sacramento	One gentleman's shirt	Napkin ring.
Katie Van Voorhies (twelve years old)	Sacramento	Worsted embroidery	Butter knife.
Belle Knox	Sacramento	Worsted embroidery	Napkin ring.
Eva K. Hadley	Sacramento	Cotton crochet	Napkin ring.
Emily Thompson (eleven years old)	Sacramento	Leaf and moss work	Napkin ring.
Emily Thompson (eleven years old)	Sacramento	Worsted embroidery	Napkin ring.
Pauline Morrill (thirteen years old)	Sacramento	Decalcomanie picture	Napkin ring.
Grace Morrill (twelve years old)	Sacramento	Work box	Napkin ring.
Katie Jackson	Elk Grove	One log cabin quilt	Napkin ring.
Nancy Jackson	Elk Grove	One log cabin quilt	Napkin ring.
Emma Hartwell (eleven years old)	Sacramento	Hand sewing	Napkin ring.
Kittie Allmond (eleven years old)	Sacramento	Plain and ornamental penmanship (very superior)	Napkin ring.
Kittie Allmond (eleven years old)	Sacramento	Pencil drawings	Napkin ring.
Mrs. G. F. Howlett	Sacramento	Best specimens of sea moss	Napkin ring.
Minnie McNeil (six years old)	Sacramento	Two tidies	Napkin ring.

JUVENILE DEPARTMENT—Continued.

Exhibitor.	Post Office.	Article.	Premium.
Mary H. Moore	Sacramento	Medley picture	Napkin ring.
Mary Heilbron (six years old)	Sacramento	One crochet tidy	Napkin ring.
Carrie E. Usher	Sacramento	Pen drawing	Napkin ring.
Nellie Dunlap	Sacramento	Pencil drawing	Napkin ring.
Eloise Marvin (twelve years old)	Sacramento	Best cotton embroidery	Butter knife.
Eloise Marvin (twelve years old)	Sacramento	Best braid work	Napkin ring.
Nellie Lansing (eleven years old)	Sacramento	Dried fruit	Napkin ring.

CLASS II.

Exhibitor.	Post Office.	Article.	Premium.
Huntington, Hopkins & Co	Sacramento	Best display of rubber hose and belting	Silver medal.
Huntington, Hopkins & Co	Sacramento	Best display of leather hose and belting	Silver medal.
Frazee & Scullion	Sacramento	Best set of carriage harness	$10 and sil. medal.
R. Stone & Co	Sacramento	Best set of farm harness	$10
R. Stone & Co	Sacramento	Best display of saddles and bridles	$10
R. Stone & Co	Sacramento	Best display of hames	$3
S. S. Kast	San Francisco	Best pair gent's dress boots	$5
S. S. Kast	San Francisco	Best pair gent's heavy boots	$5
S. S. Kast	San Francisco	Best pair gent's dress shoes	$5
S. S. Kast	San Francisco	Best pair congress gaiters	$5
S. S. Kast	San Francisco	Best pair ladies' slippers	$3
S. S. Kast	San Francisco	Best pair ladies' gaiters	$3
S. S. Kast	San Francisco	Best pair ladies' bootees	$3
J. C. Meussdorffer	Sacramento	Best gent's silk hat	$5
J. C. Meussdorffer	Sacramento	Best exhibit of men's hats and caps	Silver medal.
D. H. Quinn	Sacramento	Best soft hat	$5

CLASS III.

Exhibitor.	Post Office.	Article.	Premium.
M. Kraker	Sacramento	Best display of ladies' and children's clothing	$25
M. Kraker	Sacramento	Best silk embroidery	$5
M. Kraker	Sacramento	Best specimen of braid work.	$5
Miss Jovete M. Pierce.	Sacramento	Best tablecover	$5
Miss C. D. Alden	San Francisco	Best chenille embroidery	$5
Mrs. H. Kuhl	Sacramento	Best crochet shawl	$5
Mrs. W. E. Wood	Oakland	Best fancy chair cushion	$5
Mrs. D. W. Welty	Sacramento	Best embroidery with beads	$5
Mrs. L. Howe	Woodland	Best embroidered sofa cushion	$5
Mrs. H. Kuhl	Sacramento	Best knit cloak	$3
Mrs. R. W. Murphy	Sacramento	Best display of millinery	$20
Mrs. R. W. Murphy	Sacramento	Best velvet bonnet	$5
Mrs. R. W. Murphy	Sacramento	Best silk bonnet	$5
Mrs. R. W. Murphy	Sacramento	Best display of artificial flowers	$10
Mrs. H. Kuhl	Sacramento	Best crochet shawl	$5
Mrs. H. Kuhl	Sacramento	Best lamp-stand mat	$3
Mrs. H. Kuhl	Sacramento	One case zephyr goods	Diploma.
Mrs. H. Kuhl	Sacramento	Silk embroidery	Diploma.
Mrs. E. M. Wilson	Elk Grove	Best crochet afghan	Napkin ring.
Miss Mary Chambers	San Francisco	Best embroidered afghan	$5
Mrs. J. H. Winn	Sacramento	Best children's afghan	$5
Mrs. M. E. Scott	Moore's Station, El Dorado County	Best display of tatting	Napkin ring.
Mrs. Wm. M. Lyon	Sacramento	Best embroidered handkerchief	$3
Mrs. Wm. M. Lyon	Sacramento	Best specimen leaf work	$5
Mrs. M. E. Miller	Sacramento	Best embroidered picture	$10
A. Menke	Sacramento	Best shell boxes	$5
A. Menke	Sacramento	Best embroidery with beads	$5
Mme. Anna Getz Lucas	San Francisco	Best pressed natural flowers	Silver medal.
Mme. Anna Getz Lucas	San Francisco	Best wax statuary	$10
Mme. Anna Getz Lucas	San Francisco	Best specimen of wax flowers.	$10
Mme. Anna Getz Lucas	San Francisco	Best specimen of wax fruit	$5
Mme. Anna Getz Lucas	San Francisco	Best and largest variety of wax fruits	$10
Mrs. C. N. Hartwell	Sacramento	Best moss and lichen work	$5
Mrs. L. A. Barton	Sacramento	Best shell work	$5
Miss Jovete M. Pierce.	Sacramento	Best feather wreath	Napkin ring.
Miss Isabella Siebenthaler	Sacramento	Best tatting collar.	$3
Mrs. N. J. Favero	Sacramento	Best white quilt	$5
Mrs. C. W. Clark	Sacramento	Best patchwork quilt	$5
Mrs. H. J. Jackson	Elk Grove	Best silk quilt	$5
G. D. Allmond	Sacramento	Best log cabin quilt	Napkin ring.
D. H. Quinn	Sacramento	Best assortment of leather gloves and mittens	Silver medal.
Mrs. E. M. Wilson	Elk Grove	Best collection of furs	$25
Mrs. M. Gerrish	Sacramento	One buggy robe	Butter knife.
M. Kraker	Sacramento	One patchwork quilt	Napkin ring.
Mrs. C. M. Jenkins	Los Angeles	Best display of fancy goods	Diploma.
Mrs. C. M. Jenkins	Los Angeles	Mohair opera cloak Wool bouquet	$10 and hon. men.
Mrs. C. Nehrbass (70 years of age)	Sacramento	Knit work	Napkin ring.

CLASS III—Continued.

Exhibitor.	Post Office.	Article.	Premium.
Miss Irene Felter	Sacramento	Sofa cushion cover	Napkin ring.
Miss Irene Felter	Sacramento	Silk lounge afghan	
Mrs. Dr. Pierson	Sacramento	Sofa cushion cover	Napkin ring.
Mrs. Dr. Pierson	Sacramento	Crochet afghan (beautiful work)	
W. A. Smith		Large and beautiful display of dried grass	Hon. mention.
Mrs. Dr. Logan	Sacramento	Crochet cloak	Spec. pre. recom.
Mrs. A. Thiess	Sacramento	Display of lace work	Napkin ring.
Mrs. R. H. Haskell	Sacramento	Fine knit stockings	Napkin ring.
Mrs. James Lansing	Sacramento	Down spread and pillow	Napkin ring.
Mme. Cecil Romer	Sacramento	Beautiful dress model of ladies' clothing (California made)	$25 and diploma.
Mrs. Wm. M. Lyon	Sacramento	Cotton embroidery	Napkin ring.
Mrs. Wm. M. Lyon	Sacramento	Large and beautiful display of fancy work	
Mrs. G. Howlett (75 years of age)	Sacramento	Cotton embroidery	Napkin ring.
Mrs. Mary A. Beck	Sacramento	Wax work	Napkin ring.
Mrs. J. Idiens		Tarleton wreath	Napkin ring.
Mrs. Mary Barnes	Truckee	Best specimen of worsted flowers	Napkin ring.
A. Manning	Sacramento	Fruit and seed wreath	Napkin ring.
Miss Gussie Wilcox	Sacramento	Snow-flake baskets and bead work	Napkin ring.
Mrs. F. N. Fish	Sacramento	Large collection of nice crochet work	Napkin ring.
J. Lind	San Francisco	One case of fancy shell goods	Diploma.
Mrs. J. D. Storch	Sacramento	Hair work	Napkin ring.
Mrs. George Cox	Sacramento	Wax work	Hon. mention.
Mrs. E. M. Wilson	Elk Grove	Tidies	Hon. mention.
Mrs. Chas. Arnold	Sacramento	Embroidery	Hon. mention.
Mrs. J. R. Quinn		Bead work	Napkin ring.
Mrs. R. W. Murphy	Sacramento	Display of feathers	Napkin ring.
Mrs. Wm. Kendall	Sacramento	Knit stockings	Napkin ring.
Mrs. S. H. Howe	Woodland	Bead cushions	Hon. mention.
Miss Gussie Wilcox	Sacramento	Tidies	Hon. mention.
Mrs. Dr. Cluness	Sacramento	Phantom bouquet	Hon. mention.
Mrs. Dwight Pierce	Sacramento	One quilt	Hon. mention.
Mrs. Joseph Idiens	Sacramento	Alum basket and crystallized flowers	Hon. mention.
Mrs. Robinson	San Francisco	Embroidered pincushion	Napkin ring.
Miss Mary Batcher		Silk embroidery	Napkin ring.
Miss Agnes Hummell		Silk embroidery	$3
Miss Agnes Hummell		Toilet set	$5
Miss Agnes Hummell		Lace tidies	Napkin ring.

FOURTH DEPARTMENT.

CLASSES I AND II.

Exhibitor.	Post Office.	Article.	Premium.
Sol. H. Davis	Sacramento	One case mechanies' tools	Diploma.
Sol. H. Davis	Sacramento	One California frame tool chest	Diploma.
J. F. Harrison & Co	Sacramento	One case plated ware	Diploma.
Bush & Bros	Sacramento	Display of gas chandeliers, glass shades, portable lamps, gas toddy kettle, flat irons	$10 and Diploma.
Wick & Clark	Sacramento	Burial casket	Diploma.
J. Hurtell	Rocklin	Models of stone-cutters' tools	$5 and Diploma.
Warren Holt	San Francisco	One set double-action gate hinges	Diploma.
Warren Holt	San Francisco	One set single-action gate hinges	Diploma.
Warren Holt	San Francisco	Norton's door butts	Diploma.
Gillig, Mott & Co	Sacramento	Jewett's water cooler and filter	Diploma.
Gillig, Mott & Co	Sacramento	Coach lamps	Diploma.
Gillig, Mott & Co	Sacramento	Miners' safety candlestick	Diploma.
Gillig, Mott & Co	Sacramento	Metal-lined wooden pails	Dip. and special mention.
Gillig, Mott & Co	Sacramento	Rathbone ranges	$10
Warren Holt	San Francisco	Improved patent folding desk and seat	Diploma.
G. Hillge	Sacramento	Locks for store and house, and padlocks	$5
G. Thomas	Reno, Nevada	Automatic car coupling	Hon. mention.
J. M. Keeler & Co	San Francisco	One "Chase" pipe-cutting machine	Diploma.
C. B. Brown	Placerville	Two hydraulic mining lamps	Diploma.
G. A. Potter	San Francisco	The Excelsior cooking materials	Hon. mention.
A. Menke	Sacramento	Best ornamental statuary	$5
Huntington, Hopkins & Co	Sacramento	Best display of brass-work	$20 and Diploma.
Huntington, Hopkins & Co	Sacramento	Best display of axes	$5
Huntington, Hopkins & Co	Sacramento	Best display of general hardware	$10
Huntington, Hopkins & Co	Sacramento	Best display of iron and steel	$5
Huntington, Hopkins & Co	Sacramento	Best display of mechanics' tools	$10
Huntington, Hopkins & Co	Sacramento	Best display of pocket cutlery	$5
Huntington, Hopkins & Co	Sacramento	Best display of circular saws	$5
Huntington, Hopkins & Co	Sacramento	Best display of mill saws	$5
Huntington, Hopkins & Co	Sacramento	Best display of hand saws	$5
Huntington, Hopkins & Co	Sacramento	Best display of files	$5
Huntington, Hopkins & Co	Sacramento	Best display of pruning knives	$5

CLASSES I AND II—Continued.

Exhibitor.	Post Office.	Article.	Premium.
Huntington, Hopkins & Co.	Sacramento	Best display of shot	$5
Huntington, Hopkins & Co.	Sacramento	Best display of artificial metal	$5
Wm. Friel	San Francisco	The Paragon vapor stove burner	$5 and Diploma.
P. J. Chrisler	Vallejo	Can openers	Hon. mention.
Mansfield, Wing & Co.	Sacramento	Assortment of fancy mouldings	$5
A. Menke	Sacramento	Best display paper hangings	$5

CLASS III.

Exhibitor.	Post Office.	Article.	Premium.
Kohler, Chase & Co	San Francisco	Decker's grand piano	$20
J. W. Strobridge, Jr	Sacramento	Hallet, Davis & Co.'s square piano	$20
J. W. Strobridge, Jr	Sacramento	Hallet, Davis & Co.'s Boudoir piano	$20
Kohler, Chase & Co	San Francisco	Decker's parlor piano	$10
J. F. Cooper	Sacramento	Estee organ	Special mention.
J. W. Strobridge, Jr	Sacramento	George Woods' parlor organ	Special mention.
J. W. Strobridge, Jr	Sacramento	George Woods' small organ	Special mention.
A. Menke	Sacramento	Best display of small musical instruments	Silver medal.
A. Menke	Sacramento	Two inlaid boxes, California manufacture	$5
Rickoff & Clark	San Francisco	Spring beds	Diploma.
John Breuner	Sacramento	Best dressing bureau	$10
John Breuner	Sacramento	Best sofa	$10
John Breuner	Sacramento	Best lounge	$5
John Breuner	Sacramento	Best extension table	$5
John Breuner	Sacramento	Best office chair	$5
John Breuner	Sacramento	Best set parlor chairs	$10
John Breuner	Sacramento	Best center table	$5
John Breuner	Sacramento	Best pair side tables	$5
John Breuner	Sacramento	Best set parlor furniture	$20
John Breuner	Sacramento	Best display furniture	$20
John Breuner	Sacramento	Best display mattresses	$5
John Breuner	Sacramento	Best writing desk	$5
John Breuner	Sacramento	Best bookcase	$5
John Breuner	Sacramento	Best wardrobe	$10
John Breuner	Sacramento	Best set bedroom furniture	$10
John Breuner	Sacramento	Best display upholstery	$10
John Breuner	Sacramento	Best office desk	$5
John Breuner	Sacramento	Best sick chair	$5
John Breuner	Sacramento	Best display hair and feather pillows	$5
John Breuner	Sacramento	Spring mattresses	Diploma.
Warren Holt	San Francisco	School furniture	$10
I. J. Hattabaugh	San José	Wire suspension spring bed	Diploma.

CLASS III—Continued.

Exhibitor.	Post Office.	Article.	Premium.
Rickoff & Clark		Crandall's improved spring bed	Diploma.
J. B. Sherburn & Co.		Spring bed cover	Diploma.
Kendall, Klinge & Co.		Wool mattress, Lane patent	Diploma.
A. Menke	Sacramento	Assortment of brushes	$5
A. Menke	Sacramento	Best writing desks	$5
A. Menke	Sacramento	Best gilt frames	$5
P. Liesenfield	San Francisco	Best billiard table, flat steel spring combination cushion	$10
P. Liesenfield	San Francisco	One monitor and pigeon hole combined	Hon. mention.

CLASS IV.

Exhibitor.	Post Office.	Article.	Premium.
John Boeker	Sacramento	Best display willow ware	$10
John Boeker	Sacramento	Best display osier willow	$5
Nichols & Co.	Sacramento	Best display cedar ware	$5
Nichols & Co.	Sacramento	Best display pine ware	$5
Nichols & Co.	Sacramento	Best display wooden ware	$25
Nichols & Co.	Sacramento	Best assortment coopers' ware	$15
J. F. Harrison & Co.	Sacramento	Best display split wood baskets	$3
Robinson, Fowler & Co.	Vallejo	Patent socket brooms and brushes	Diploma.
Robinson, Fowler & Co.	Vallejo	Best exhibit of broom corn, brooms, and brushes	$5

CLASSES V AND VI.

Exhibitor.	Post Office.	Article.	Premium.
W. C. Harding	Sacramento	Specimens of dentistry (very meritorious)	Silver medal.
C. Jurgins	Sacramento	Best glue	$5 and Dip. rec.
Bowen Bros.	Sacramento	Best exhibit of yeast powder.	Diploma.
J. F. Fugazi	Sacramento	Best exhibit of hair restorer, hair dye, perfumery, toilet articles, and perfumery fountain	Silver medal.
Derwin & Hedrich	Sacramento	Patent axle grease	Diploma.
Carlton & Newman	San Francisco	Best demijohns and fruit jars.	Diploma.
John Breuner	Sacramento	Best looking-glass	Diploma.

CLASS VII.

Exhibitor.	Post Office.	Article.	Premium.
Aitken & Luce	Sacramento	Display California marble	$20
Bergman Bros	Sacramento	Best specimen Rockingham ware	Diploma.
Bergman Bros	Sacramento	Best specimen stoneware	$10
Bergman Bros	Sacramento	Best roofing tile	$5
Bergman Bros	Sacramento	Best flooring tile	$5
Bergman Bros	Sacramento	Best terra cotta	Diploma.
Bergman Bros	Sacramento	Best pottery (various kinds)	Silver medal.
Bergman Bros	Sacramento	Best fire brick	$3
Withington & Bro	Sacramento	Best display of soap	Silver medal.
Withington & Bro	Sacramento	Best display of washing powder	Diploma.
Huntington, Hopkins & Co	Sacramento	Best stove polish	$5
A. Henley	Yolo County	Samples of building brick	Diploma.

CLASSES VIII AND IX.

Exhibitor.	Post Office.	Article.	Premium.
R. E. Gogings	Sacramento	Best stuffed animals and birds	Silver medal.
B. R. Sweetland	Sacramento	One case minerals and shells	Silver medal.
G. D. Allmond	Sacramento	One case minerals	Silver medal.
G. Griffith	Rocklin	One piece dry dock stone	Hon. mention.
F. E. Davis	Sacramento	One frame Masonic emblems and Odd Fellows' emblems in marble	Hon. mention.
		California drawings and designs by minors and apprentices.	
Robert Moore	San Francisco	Best drawing of Epplesheimer's hoisting engine	Gold medal.
J. K. Frith	San Francisco	Best original design of compound engine for a steam yacht	Silver medal.

FIFTH DEPARTMENT.

CLASS I.

Exhibitor.	Post Office.	Article.	Premium.
D. R. Prince	Altaville	Best exhibit silk cocoons	$25
D. R. Prince	Altaville	Best exhibit silk in skeins	Diploma.

CLASS II.

Exhibitor.	Post Office.	Article.	Premium.
M. Bryte	Sacramento	Best exhibit of chiccory	Diploma.
M. Biggs	Butte County	Exhibit of wheat	$20
M. Biggs	Butte County	Exhibit of Nepul barley	$10
M. Biggs	Butte County	Exhibit of Chevalier barley	$10
M. Biggs	Butte County	Exhibit of common barley	$10
W. S. Manlove	Sacramento	Exhibit bearded Chili wheat	$20
W. M. Haynie	Sacramento	Exhibit of hops	$10
Joseph Blake	Suisun	Exhibit of White Mediterranean wheat	$20
A. T. Hatch	Suisun	Exhibit of Excelsior Club wheat	$20
A. T. Hatch	Suisun	Exhibit Touzelle Club wheat	$20
P. H. Fisher	Sacramento	Exhibit of white corn	$10
John Smith	Sacramento	Best exhibit sugar beet seed	$3
T. L. Chamberlin	Lincoln	Exhibit of Tappahannock wheat	$20
Wm. Van Worte	Butte County	Exhibit of Pride of Butte wheat	$20
Goss & Co	Butte County	Exhibit of flour (Durham Mills)	Diploma.
John Bidwell	Chico	Exhibit of flour (Chico Mills)	Hon. mention.
A. B. Gilbert	Sacramento	Exhibit of yellow corn	$10

CLASS III.

Exhibitor.	Post Office.	Article.	Premium.
F. Gabrille	Sacramento	Best exhibit sweet potatoes	$5
F. Gabrille	Sacramento	Best exhibit parsnips	$3
F. Gabrille	Sacramento	Best exhibit carrots	$3
F. Gabrille	Sacramento	Best exhibit long blood beets	$3
F. Gabrille	Sacramento	Best exhibit drumhead cabbage	$3
F. Gabrille	Sacramento	Best exhibit red Dutch cabbage	$3

CLASS III—Continued.

Exhibitor.	Post Office.	Article.	Premium.
F. Gabrille	Sacramento	Best exhibit variety of cabbage	$3
F. Gabrille	Sacramento	Best exhibit cauliflower	$3
F. Gabrille	Sacramento	Best exhibit broccoli	$3
F. Gabrille	Sacramento	Best exhibit lettuce	$2
F. Gabrille	Sacramento	Best exhibit red onions	$3
F. Gabrille	Sacramento	Best exhibit yellow onions	$3
F. Gabrille	Sacramento	Best exhibit white onions	$3
F. Gabrille	Sacramento	Best exhibit peppers	$3
F. Gabrille	Sacramento	Best exhibit salsify	$3
F. Gabrille	Sacramento	Best exhibit celery	$3
F. Gabrille	Sacramento	Best exhibit pole beans other than Lima	$2
F. Gabrille	Sacramento	Best exhibit kidney beans	$3
F. Gabrille	Sacramento	Best exhibit Lima beans	$3
F. Gabrille	Sacramento	Best exhibit egg plants	$5
F. Gabrille	Sacramento	Second best table of varieties of vegetables	$20
G. W. Fern	Sacramento	Best and greatest variety of potatoes	$10
G. W. Fern	Sacramento	Best Hubbard squash	$3
Peter Burns	Sacramento	Best variety turnip beets	$3
Peter Burns	Sacramento	Best Valparaiso squash	$3
John Smith	Sacramento	Best six sugar beets	$3
John Smith	Sacramento	Best Tropley tomatoes	$3
A. B. Gilbert	Sacramento	Best six mammoth squashes	$3
A. B. Gilbert	Sacramento	Best sweet corn	$3
A. B. Gilbert	Sacramento	Best three mountain watermelons	$3
A. B. Gilbert	Sacramento	Best six cucumbers	$2
P. H. Fisher	Sacramento	Best and largest pumpkin	$5
P. H. Fisher	Sacramento	Best custard squash	Special mention.
C. W. Hoit	Sacramento	Best three green-fleshed melons	$3
W. S. Manlove	Sacramento	Best white beans	$3
Wm. Kendall	Sacramento	Best field peas, dry	$2
E. F. Aitken	Sacramento	Best garden peas	$3
E. F. Aitken	Sacramento	Best castor oil beans	$5
E. F. Aitken	Sacramento	Best and greatest variety of peas	$5
Mrs. Cronkite	Sacramento	Best gerkin cucumbers	$3
W. D. Fickett	Yolo	Best cranberry beans	$3
DeBernardi & Selna	Sacramento	Best table of vegetables	$30

CLASS VI—BUTTER, BREAD, ETC.

Exhibitor.	Post Office.	Article.	Premium.
Miss H. E. Sprague	Sacramento	Best butter in bulk	$15
Miss S. M. Burns	Sacramento	Best butter in rolls	$10
Miss A. J. Gerrish	Sacramento	Best brown bread	$5
Miss A. J. Gerrish	Sacramento	Best wheat bread	$5
Nellie Lansing (eleven years old)	Sacramento	Best biscuit	$5

CLASS VII.

Exhibitor.	Post Office.	Article.	Premium.
J. S. Harbison	San Diego	Best honey	$5
Capital Sugar Refinery	Sacramento	Best sugar from beets	$20
Mrs. M. Hoover	Elk Grove	Best brandied fruit	$5
Mrs. M. Hoover	Elk Grove	Best fruit in jars	$20
Mrs. M. Hoover	Elk Grove	Best salads	$5
Mrs. M. Hoover	Elk Grove	Best spiced fruit	$5
Mrs. M. Hoover	Elk Grove	Best varieties of candied fruit.	$5
Mrs. Cronkite	Sacramento	Best exhibit of jellies	$20
Mrs. Cronkite	Sacramento	Best preserved fruit in glass	$10
Mrs. Cronkite	Sacramento	Best pickles in glass	$15

SIXTH DEPARTMENT.

CLASS I.

Exhibitor.	Post Office.	Article.	Premium.
I. S. Bamber	Placerville	Best display of apples	$20
I. S. Bamber	Placerville	Best twelve varieties apples	$10
I. S. Bamber	Placerville	Best display of pears	$20
I. S. Bamber	Placerville	Best twelve varieties pears	$10
I. S. Bamber	Placerville	Best six varieties peaches	$10
I. S. Bamber	Placerville	Best one variety peaches	$5
I. S. Bamber	Placerville	Best display of plums	$10
I. S. Bamber	Placerville	Best five varieties plums	$5
I. S. Bamber	Placerville	Best one variety plums	$3
W. S. Manlove	Sacramento	Best three varieties apples	$3
W. S. Manlove	Sacramento	Best display of figs	$5
T. K. Stewart	Sacramento	Best three varieties pears	$3
T. K. Stewart	Sacramento	Best display tropical fruit	$10
T. K. Stewart	Sacramento	Best display oranges	$5
Jos. Putnam	Mokelumne River	Best six varieties apples	$5
J. F. Madden	Sacramento	Variety of apples	Hon. mention.
E. M. Smith	Coloma	Display of six varieties pears.	$5
E. M. Smith	Coloma	Best display peaches	$15
C. H. Swift		Best display quinces	Hon. mention.

CLASS II—DRIED FRUIT, ETC.

Exhibitor.	Post Office.	Article.	Premium.
Mrs. Cronkite	Sacramento	Dried berries, eleven varieties	$5
Miss F. M. Smith	Sacramento	Display of sun-dried apples	$5
Miss A. Cohen		Display of sun-dried pears	$5
Mrs. E. F. Aitken	Sacramento	Display of sun-dried peaches	$5
Miss F. M. Smith	Sacramento	Display of dried plums	$5
Mrs. E. F. Aitken	Sacramento	Display of dried apricots	$5
Miss Nellie Lansing	Sacramento	Display of dried raisins, apples, and almonds	$5
Miss H. E. Sprague	Sacramento	Display of dried pears, plums, and corn	$5
J. M. Purrinton		Display of dried fruits	Diploma.
G. W. Deitzler	San Francisco	Display of dried and preserved fruits	Silver medal.
Mrs. A. Cowne	Sacramento	Display of variety of dried fruit—apples, peaches, and almonds	$15
I. S. Bamber	Placerville	Best twenty-five pounds of raisins	$25
R. A. Rose		Display of almonds	$5
J. R. Nickeson*	Placer County	Best twelve varieties of wine grapes	$25
J. R. Nickeson	Placer County	Best six varieties of wine grapes	$20
J. R. Nickeson	Placer County	Best three varieties of wine grapes	$15
J. R. Nickeson	Placer County	Best two varieties of wine grapes	$10
J. R. Nickeson	Placer County	Best one variety of wine grapes	$10
J. R. Nickeson	Placer County	Best and greatest variety of wine grapes	$25
J. R. Nickeson	Placer County	Second best variety of wine grapes	$15
J. H. Carrington		Best twelve varieties of table grapes	$10
J. H. Carrington		Best six varieties of table grapes	$5
J. H. Carrington		Best three varieties of table grapes	$3

* Gold medal recommended by committee for J. R. Nickeson.

MISCELLANEOUS—BRANDY, WINE, ETC.

Exhibitor.	Post Office.	Article.	Premium.
B. N. Bugbey	Folsom	Best brandy, 1870	$25
B. N. Bugbey	Folsom	Best white wine, 1873	$25
B. N. Bugbey	Folsom	Best red wine, 1872	$25
Robert Chalmers	Coloma	Best sweet wine, "Green Hungarian," 1872	$25
Mrs. H. Cronkite	Sacramento	Best California port wine	$25
B. N. Bugbey	Folsom	Best California sherry, 1870	$25
Robert Chalmers	Coloma	Best angelica wine, 1872	$25

MISCELLANEOUS—BRANDY, WINE, ETC.—Continued.

Exhibitor.	Post Office.	Article.	Premium.
Robert Chalmers	Coloma	Catawba wine bitters	Special mention.
Powers & Henderson	Sacramento	Exhibit of "Tamiama Bitters"	Diploma.
Merrifield & Rosener	San Francisco	Ale and porter, California manufacture	Silver medal.
Mrs. F. L. Manlove	Sacramento	Best grape syrup	$10

SEVENTH DEPARTMENT.

CLASS I—FINE ARTS.

Exhibitor.	Post Office.	Article.	Premium.
Norton Bush	San Francisco	Best exhibit of paintings by one artist	$150
F. J. Lewis	Sacramento	Best painting by any exhibitor (Silver Lake)	$100
F. J. Lewis	Sacramento	Best specimen of landscape painting	$25
Charles Warren	Sacramento	Best painting in oil, by minors	$20
Mrs. Geo. D. Stewart	Sacramento	Best specimen of landscape painting in water-colors	$25
Mrs. M. E. Hayden	Sacramento	Exhibit of oil paintings	$10 sp. prem. rec.
P. J. Hopper	Sacramento	Best monochromatic drawing	$25
Mrs. Geo. D. Stewart	Sacramento	Best crayon drawings	Hon. mention.
Mrs. George Cox	Sacramento	One crayon drawing	Napkin ring.
Miss Helen M. Brooks	Sacramento	Display of portraits in crayon (very fine)	Gold medal.
F. J. Lewis	Sacramento	One pen drawing (from nature)	Hon. mention.
Al. Smith	Sacramento	Best exhibition of photographs	$50
Mansfield, Wing & Co.	Sacramento	Display of chromos	Diploma.
H. S. Beals	Sacramento	Exhibition of photographs	Special prem. rec.
C. C. Brown	Sacramento	Display of ornamental penmanship	Diploma.
E. C. Atkinson	Sacramento	Specimen of plain penmanship	Diploma.

CLASS II.

Exhibitor.	Post Office.	Article.	Premium.
Aitken & Luce	Sacramento	Best exhibition of sculpture	$25
Aitken & Luce	Sacramento	Best exhibition of statuary and busts in plaster	$25
Aitken & Luce	Sacramento	Best collection of marble work	$75

MISCELLANEOUS.

Exhibitor.	Post Office.	Article.	Premium.
Mrs. Hoover	Elk Grove	Display of nine varieties of candied fruits	Special mention.
Mrs. Hoover	Elk Grove	One silver tree	Hon. mention.
Mrs. Hoover	Elk Grove	One lead tree	Napkin ring.
Mrs. Hoover	Elk Grove	One tin tree	Hon. mention.
Mrs. Cronkite	Sacramento	Two jars pear syrup	Hon. mention.
Mrs. Leland Howe	Sacramento	One scrap book	Hon. mention.
R. S. Thompson	Napa	One Adams' Chart of History	Hon. mention.
C. H. Allmond	Sacramento	Collection of California bird eggs	Hon. mention.
C. H. Allmond	Sacramento	A newspaper, printed in the year eighteen hundred	Hon. mention.
C. H. Allmond	Sacramento	Collection ancient coins	Hon. mention.
Mrs. E. M. Wilson	Elk Grove	Pair of blankets, woven and spun by a lady sixty-five years old	Hon. mention.
Mrs. E. M. Wilson	Elk Grove	One bedspread	Hon. mention.
Jos. Parrington	Sacramento	Crystallized fruit, six varieti's	Hon. mention.
Miss S. Abbey	San Francisco	Grand Excelsior American Chart for dress cutting	Diploma.
W. P. Sherwood	Sacramento	One utility adjustable table	Special mention.
D. McCarthy		Cage of Irish thrushes	Hon. mention.
A. Menke	Sacramento	Fancy baby carriage, "The Bon Ton," English manufacture	Diploma.
A. Menke	Sacramento	Fancy baby carriage, "The Bon Ton," American manufacture	Diploma.
H. C. Harrison	Sacramento	Rustic cone table	Napkin ring.
P. R. Kesner	Sacramento	Confectionery and candy ware	Diploma.
Mrs. J. R. Quinn	Sacramento	Hanging satchel bags	Napkin ring.
Mrs. Idiens		Wax picture frame	Hon. mention.
Mrs. Idiens		Leather bracket	Hon. mention.
Stewart & Hamilton	Dixon	Door and fancy panels	Diploma.
Henry Fisher	Sacramento	Case confectionery	Diploma.
Henry Fisher	Sacramento	Twenty-four jars candy	
D. S. W. Parkhurst	San Francisco	Money drawer	Hon. mention.
J. H. Corliss	Reno, Nev.	Vessel for measuring and drawing liquids	Diploma.
G. Thomas	Reno, Nev.	Automatic car coupling	Hon. mention.
M. C. Hawley & Co.	Sacramento	Variety of powder—sporting, blasting, and mining	Diploma.
M. C. Hawley & Co.	Sacramento	Fuse and exploders for mining purposes	Diploma.

MISCELLANEOUS—Continued.

Exhibitor.	Post Office.	Article.	Premium.
Pacific Jute Co	Oakland	Grain and wool bags, California manufacture	Silver medal.
A. Callahan	San Francisco	Combined vise and anvil for farmers' use	Diploma.
Headrich & Dirwin	Sacramento	Axle grease	Diploma.
John Hibbert	Nevada Co	Section of square tree	Hon. mention.
Dr. L. Moore	Santa Cruz	Knowlton's universal bath	Special mention.
Thos. N. Wand	San Francisco	California sardines	Silver medal.
Mrs. M. T. Griffin	Sacramento	Chart for cutting dresses—Taylor's	Diploma.
Dr. Lyford	San Francisco	Apparatus for embalming dead bodies	Silver medal.
Dr. Lyford	San Francisco	Apparatus for ventilating and disinfecting burial vaults	
Dr. Lyford	San Francisco	Apparatus for propagating oysters	Diploma.

SPEED PROGRAMME--1874.

SPEED PROGRAMME, 1874.

MONDAY, SEPTEMBER 21st, 1874.

No. 1—Running Race.

Purse—Three hundred dollars, fifty dollars entrance to be added. Dash of one mile; free for all two-year-olds. Second horse to save his entrance.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
ch. c. Chance, by Venture; dam, Annette, by Lexington	George Treat	San Francisco.
b. f. Mamie C., by Hercules; dam, a Langford mare	William Hamilton	San José.
b. c. Turf Gallery, by Rifleman; dam, Emma Barnes, by Norfolk	R. T. O'Hanlon	San José.
b. f. Susie Grattan, by Jonathan; dam, Florence, by Woodburn	James Linfoot	
b. c. Shannon, by Monday; dam, Hennie Farrow	W. H. Coombs	Napa.
b. f. Lady Washington, by Woodburn; dam, Peggy Ringgold	John Hall	Alvarado.
b. f. Fanstine, by Lodi; dam, Belle Riney	Nathan Coombs	Napa.
Vanderbilt, by Norfolk; dam, Sally Franklin	A. Musick	Sacramento.

Result.

Lady Washington	1
Shannon	2

Time—1:48.

No. 2—Running Race.

Purse—Seven hundred and fifty dollars. Dash of one and a half miles; free for all three-year-olds; five hundred dollars to first horse; one hundred and fifty dollars to second; one hundred dollars to third.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
b. f. Electra, by imported Eclipse; dam, Hennie Farrow	James Mee	San Francisco.
b. f. Lady Amanda, by imported Hurrah; dam. Lady Lancaster, by imported Monarch	J. C. Simpson	San Francisco.
b. f. Bell Mory, by Woodburn; dam, Esperanza, by Ringgold	John Hall	Alvarado.
g. c. Waterford, by Langford; dam, Margarita, by Lexington	Theodore Winters	Yolo.
ch. c. Bill Hazel, by Norfolk; dam, by Owen Dale	T. B. Winston	Carson.

Result.

Waterford	1
Electra	2
Bell Mory	3

Time—2:42½.

No. 3—Running Race.

Purse—One thousand dollars. Mile heats; free for all; seven hundred dollars to first horse, two hundred dollars to second, and one hundred dollars to third.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
s. h. Joe Daniels, by Australian; dam, Dolly Carter; five years old	L. R. Martin	San Francisco.
br. m. Nell. Flaherty, by Rifleman; dam, Jennie Hull, by Belmont	George Treat	San Francisco.
s. h. Marshal McMahon, by Norfolk; dam, Mary Britton, by Jim Brown	Thomas Atchison	Sacramento.
b. f. Alpha, by Hercules; dam, Waxy, by Lexington	R. T. O'Hanlon	San José.

Result.

Joe Daniels	1	3	1
Nell. Flaherty	2	1	3
Marshal McMahon	3	2	4
Alpha	4	4	2

Time—1:45¼; 1:47¼; 1:47¾.

TUESDAY, SEPTEMBER 22D, 1874.

No. 4—TROTTING RACE.

Purse—Five thousand dollars. Free for all, on condition that Occident and Sam. Purdy trot. Three thousand five hundred dollars to first horse, one thousand dollars to second, and five hundred dollars to third.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
b. s. Sam. Purdy, by Geo. M. Patchen, Jr.; dam, a Medoc mare	McCord & Malone	San Francisco.
br. g. Occident, by St. Clair; dam, unknown.	Jas. Tennant, for Gov. Stanford	Sacramento.

Did not fill.

No. 5—TROTTING RACE.

Purse—One thousand dollars. Free for all horses that have never beaten three minutes. Seven hundred dollars to first horse, two hundred dollars to second horse, and one hundred dollars to third horse.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
d. br. m. Flora Emmett, by McCracken's Blackhawk; dam, a Morgan Rattler mare	Thomas McClellan, for A. A. Louderback	San Francisco.
g. m. Oakland Maid, by Speculation; dam, Lady Vernon	Josiah Sessions	East Oakland.
br. m. Lou. Whipple, by Whipple's Hambletonian; dam, sister to Dan Hibbard	I. N. Killip	San Francisco.

Result.

Oakland Maid	1	1	1
Lou. Whipple	2	2	2
Flora Emmett	3	3	3

Time—2:35; 2:35¼; 2:39½.

No. 6—TROTTING RACE.

Purse—One thousand dollars. Free for all horses that have never beaten two minutes and twenty-seven seconds. Seven hundred dollars to first horse, two hundred dollars to second horse, and one hundred dollars to third horse.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
b. m. Ella Lewis, by Vermont; dam, unknown	McCord & Malone, for James R. Keene	San Francisco.
b. m. Mary Davis, by Young Rattler; dam, Lady Rotan	E. M. Skaggs	Sacramento.
br. g. George Treat, by David Hill, Jr.; dam, Clara C., by Old Morgan Blackhawk	A. F. Smith	San Francisco.
blk. s. Blackbird, by Blackbird, he by Camden, son of Shark; dam, a Messenger mare	Daniel Dennison, for M. Reavis	Sacramento.

Result.

Blackbird	1	1
Ella Lewis	2	dist.
Mary Davis	3	dist.
George Treat	4	dist.

Time—2:27; 2:22.

WEDNESDAY, SEPTEMBER 23D, 1874.

No. 7—RUNNING RACE.

Purse—Seven hundred and fifty dollars. Mile heats. Free for all three-year-olds. Five hundred dollars to first horse, one hundred and fifty dollars to second horse, and one hundred dollars to third horse.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
g. c. Waterford, by Langford; dam, Margarita, by Lexington	Theodore Winters	Davisville.
ch. c. Firetail, by Norfolk; dam, Fanny Howard	G. R. Buchanan	Stockton.
blk. f. Electra, by imported Eclipse; dam, Hennie Farrow	James Mee	San Francisco.

Result.

Electra	1	2	2
Waterford	2	1	1
Firetail	3	3	dist.

Time—1:46¼; 1:48½; 1:50.

No. 8—RUNNING RACE.

Purse—Two thousand dollars. Free for all; four mile heats; one thousand four hundred dollars to first horse, four hundred dollars to second, two hundred dollars to third.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
ch. c. Hock Hocking, by Ringmaster; dam, Young Fashion; four years old	Jos. Cairn Simpson	Oakland.
b. c. Henry, by Norfolk; dam, Versalia, by Sovereign; four years old	Henry Walsh	Alameda.

Did not fill.

SPECIAL RACE—RUNNING.

Purse—Five hundred dollars. Mile heats; for second-class horses. Thad. Stevens, Henry, Nell. Flaherty, Oceola, Alpha, Jos. Daniels, and Hubbard, barred. Three hundred and fifty dollars to first horse, one hundred dollars to second, and fifty dollars to third.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
b. m. Carrie Simons, by Norfolk; dam, Santa Clara, by Owen Dale	R. T. O'Hanlon	San José.
ch. h. Marshal McMahon, by Norfolk; dam, Fanny Britton	Thomas Atchison	Marysville.
s. h. Don Victor, by Rifleman; dam, by Belmont	A. Guerrera	San Francisco.
ch. c. Bill Hazel, by Norfolk; dam, by Owen Dale	Thomas Winston	Carson City.
ch. c. Hock Hocking, by Ringmaster; dam, Young Fashion, by imported Hurrah	J. C. Simpson	Oakland.
b. m. Blanch Hall, by Rifleman; dam, by Belmont	W. Pierce	Alameda.
b. m. Emma Skaggs, by Norfolk; dam, Lady Franklin	A. Musick	Sacramento.

Result.

Hock Hocking	4	1	1
Carrie Simons	6	5	dist.
Marshal McMahon	1	2	4
Don Victor	5	4	dist.
Bill Hazel	7	3	2
Blanch Hall	2	7	3
Emma Skaggs	3	6	dist.

Time—1:45; 1:47¼; 1:49.

THURSDAY, SEPTEMBER 24TH, 1874.

No. 9—TROTTING RACE.

Purse—One thousand dollars. Free for all horses that have never beaten two minutes and thirty-five seconds. Seven hundred dollars to first horse, two hundred dollars to second, and one hundred dollars to third.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
d. br. m. Flora Emmett, by McCracken's Blackhawk; dam, a Morgan Rattler mare	Thomas McClellan, for A. A. Louderback	San Francisco.
blk. m. Sisson Girl, by Billy McCracken; dam, unknown	McCord & Malone, for O. A. Hickok	San Francisco.
Lady Slasher, by Slasher; dam, unknown	Add. Mailliard	San Rafael.
g. m. Marysville Queen, by Signal; dam, unknown	A. F. Smith, for W. Todhunter	San Francisco.
g. m. Oakland Maid, by Speculation; dam, Lady Vernon	Josiah Sessions	East Oakland.
g. m. American Maid, by Plumas; dam, the dam of Pacific	C. W. Molthrop, for J. W. Thompson	Sacramento.
b. g. Billy Ross	Horace Hawks	Oakland.

Result.

Oakland Maid	1	1	1
Marysville Queen	2	2	2
American Maid	dist.		

Time—2:32½; 2:31; 2:37.

No. 10.

Occident Plate—Worth two thousand dollars. For any horse that beats his time, 2:16¾, without a break.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
br. g. Occident, by St. Clair; dam, unknown.	Jas. Tennant, for Governor Stanford	Sacramento.

Did not fill.

No. 11—PACING RACE.

Purse—Seven hundred and fifty dollars. Free for all that have never beaten two minutes and twenty-two seconds; five hundred dollars to

first horse, one hundred and fifty dollars to second, and one hundred dollars to third.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
s. m. Capitola	T. Kennedy	Oakland.
b. g. Ben. Butler, by old Saint Clair; dam, by Selim	A. F. Smith, for E. H. Miller	San Francisco.
b. m. Lady St. Clair, by old Saint Clair, dam, unknown	R. Brommer	San Francisco.
g. ch. g. Nimrod, by Missouri Chief; dam, by Kentucky Hunter	D. J. Green, for C. Merchant	Oakland.
b. g. Fisherman (formerly Swindle); pedigree unknown	Peter Brundow	San Francisco.

Result.

Butler	1	1	1
Lady St. Clair	2	2	2
Nimrod	3	4	4
Fisherman	4	3	3

Time—2:22; 2:19¾; 2:21¾.

FRIDAY, SEPTEMBER 25TH, 1874.

No. 12—RUNNING RACE.

Purse—One thousand dollars. Free for all; mile heats, three in five; seven hundred dollars to first horse, two hundred dollars to second, and one hundred dollars to third.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
b. h. Osceola, by Norfolk; dam, Black Maria, by Belmont	Taylor & Buckley	
b. f. Alpha, by imported Hercules; dam, Waxy, by Lexington	R. T. O'Hanlon	San José.
s. h. Joe Daniels, by Australian; dam, Dolly Carter, by Glencoe	L. R. Marshall	
br. m. Nell. Flaherty, by Rifleman; dam, Jennie Hull	George Treat	San Francisco.

Result.

Alpha	1	3	3	1	1
Osceola	2	4	4	dist.	
Joe Daniels	3	1	1	3	2
Nell. Flaherty	4	2	2	2	3

Time—1:45¼; 1:43¾; 1:46; 1:45; 1:47½.

No. 13—TROTTING RACE.

Purse—Seven hundred and fifty dollars. Free for all four-year-olds; five hundred dollars to first horse, one hundred and fifty dollars to second, and one hundred dollars to third.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
s. f. Nellie Patchen, by Alexander; dam, by Belmont	Misner & Crandall	Petaluma.
b. g. Oliver, Belmont stock, as near as known.	Crego & Bowley	San Francisco.
b. f. Fanny Allen, by Ethan Allen, Jr.; dam, Winona	William Hamilton	San José.
g. s. Freeport, by Tecumseh; dam, unknown.	Dan. Dennison, for G. Hacks	Sacramento.
g. g. Heywood Chief, by Billy Hayward; dam, unknown	T. Kennedy	East Oakland.

Result.

Oliver	1	1	1
Heywood Chief	2	2	2
Nellie Patchen	dist.		

Time—2:37½; 2:46; 2:47½.

Special Purse—Five thousand dollars. Free for all; conditioned that Occident and Purdy trot; mile heats, three in five; three thousand five hundred dollars to first horse, one thousand dollars to second, and five hundred dollars to third.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
b. s. Blackbird	D. M. Reavis	Chico.
br. g. Occident	E. H. Miller, Jr.	Sacramento.
b. s. Sam. Purdy	T. McClellan	San Francisco.

Result.

Occident	1	1	2	2	2
Purdy	2	3	1	1	1
Blackbird	3	2	3	3	3

Time—2:21; 2:24¼; 2:25¼; 2:28; 2:28¼.

SATURDAY, SEPTEMBER 26TH, 1874.

No. 14—TROTTING RACE.

Purse—One thousand dollars. Free for all. Two-mile heats. Seven hundred dollars to first horse, two hundred dollars to second horse, and one hundred dollars to third horse.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
dk. br. m. Lady Dooley, by McCracken's Blackhawk; dam, a Messenger mare	Thomas McClellan, for A. A. Louderback	San Francisco.
b. m. Mary Davis, by Young Rattler; dam, Lady Rotan	E. M. Skaggs	Sacramento.
b. m. Columb, formerly Albatross, by Blackbird; dam, by Kentucky Eclipse	Joseph Cairn Simpson	Oakland.
g. m. Oakland Maid, by Speculation; dam, Lady Vernon	Josiah Sessions	Oakland.
b. g. Dutchman, by a Morgan horse; dam, unknown	Dan. Dennison, for H. Bays	Sacramento.
g. m. Marysville Queen, by Signal; dam, unknown	A. F. Smith, for W. Todhunter	San Francisco.

Result.

Oakland Maid	1	1
Mary Davis	2	2
Dutchman	3	3
Marysville Queen	4	4

Time—5:01¼; 4:57½.

No. 15—Pacing Race.

Purse—Seven hundred and fifty dollars. Free for all; Jim Brown and Defiance to wagon. Five hundred dollars to first horse, one hundred and fifty dollars to second horse, and one hundred dollars to third horse.

Entries.

Name and pedigree of horse.	By whom entered.	P. O. address.
s. g. Longfellow; pedigree unknown	James L. Eoff	San Francisco.
b. g. Ben. Butler, by old St. Clair; dam, by Selim	A. F. Smith, for E. H. Miller	San Francisco.
b. m. Lady St. Clair, by old St. Clair; dam, unknown	R. Brommer	San Francisco.
g. g. Voorhees	F. A. Charles	San Francisco.
b. m. Prussian Maid, by Signal; dam, by Lummax	Geo. Martin, for Governor Stanford	Sacramento.
b. g. Fisherman (formerly Swindle); pedigree unknown	Peter Brundow	San Francisco.
gold ch. g. Nimrod, by Mission Chief; dam, by Kentucky Hunter	D. J. Green, for C. Merchant	Oakland.

Result.

Ben. Butler	1	1	3	5	4	3	3
Longfellow	2	2	0	2	3	1	2
Lady St. Clair	6	5	4	3	5	0	0
Nimrod	3	3	0	1	1	2	1
Voorhees	4	dist.					
Fisherman	5	4	5	4	2	0	0

Time—2:21; 2:20½; 2:20¾; 2:20; 2:24; 2:21½; 2:22½.

CLAIMS FOR GOLD MEDALS FOR 1874,

AND

AWARDS OF THE COMMITTEE.

CLAIMS FOR THE GOLD MEDALS FOR 1874.

SECOND DEPARTMENT.

San Francisco, December 17th, 1874.

Secretary of the State Agricultural Society:

Dear Sir: As we have been awarded the first premium at the late Fair, and are competitors for the gold medal to be awarded for the most meritorious display and most useful to the State, in the class to which we belong, we have deemed it proper to suggest to your Gold Medal Committee some reasons and considerations why the gold medal should be awarded to us.

First—We are one of the oldest carriage manufacturing establishments in the State, and have finally succeeded in profitably employing and developing California labor, skill, and capital, in an important branch of manufacture, and in building up and establishing a prosperous business, in spite of Eastern cheap labor and competition.

Second—We are the only company on this coast that strictly confines its business to the manufacture of first-class carriages, Clarence coaches, etc., in successful competition with the best Eastern manufacturers, and we have made the manufacture of them our specialty, that we might secure the highest excellence, and command the market on this coast.

Third—The business which we have thus established upon a basis which defies competition, is destined to expand in importance as the wealth and population of the State increases, until in the very near future it will save to and retain in the State hundreds of thousands of dollars annually, which would otherwise be sent out of and lost to the State, and thus depriving large numbers of our most skilled mechanics of employment.

Fourth—We are also hoping and expecting that many of the materials required in the manufacture of carriages, in consequence of the steadily increasing demand for them created by our business, will soon be produced in our State, thus largely extending the field of productive industry.

From these considerations we deem ourselves entitled to the gold medal to be awarded to our class, and submit our claim to your favorable consideration.

Respectfully yours,

CARVILL MANUFACTURING CO.

THIRD DEPARTMENT.

SACRAMENTO, October 22d, 1874.

To the Committee on Gold Medals, California State Agricultural Society:

GENTLEMEN: We would respectfully call your attention to our claim for the gold medal for the Third Department. Our display consisted of harness, saddles, and bridles, horse clothing, robes, whips, bits, spurs, etc., and a special entry of horse collars and hames.

Although we were not awarded the first premium on carriage harness, on account of the committee not being good judges of the work, it was generally conceded by all good judges of the work, by the officers of the State Agricultural Society, and by the manufacturers of the work on which the first premium was awarded themselves, that our carriage harness was far superior to those that received the first premium. We claim to have made the best display of these goods that has ever been made at any State Fair held in this State. The harness, saddles, and bridles, and horse collars, were of our own manufacture, and we claim that it was the best on exhibition. We also claim to having made the best display in the Third Department; therefore we are entitled to the gold medal.

All of which we submit to your consideration, and remain,

Yours, very respectfully,

R. STONE & CO.

SACRAMENTO, October 8th, 1874.

To the Committee on Gold Medals:

GENTLEMEN: We desire to enter the hats which we had on exhibition at the last annual Fair, for competition for the gold medal of the society in the Third Department. We claim the medal, first, on account of the number and variety of the hats exhibited by us, embracing soft silver beavers, nutrias, soft and stiff cassimeres—in all colors and qualities—silk hats, of felt bodies and the adherent or adhesive lining. We claim, for our silk hats, superiority of material and workmanship, and, also, for the most meritorious exhibition in this department, and worthy of

encouragement—being the largest manufacturer of silk hats in this State and on the Pacific Coast.

Yours, most respectfully,

J. C. MEUSSDORFFER.

By JOHN F. SLATER,
Business Manager.

FOURTH DEPARTMENT.

PLACERVILLE, December 15th, 1874.

Mr. R. BECK, *Secretary of the State Board of Agriculture:*

DEAR SIR: I herewith send you my claims for the gold medal in the Fourth Department, first and second classes.

First—That it is strictly a California invention, and that home inventions should be awarded premiums in preference to Eastern manufacturers.

Second—That it is the first and only lamp suitable for lighting mining claims, for which the miners have long stood in need of.

Third—I claim it on the ground that most of the articles in this department were of Eastern manufacture that were awarded a premium, or that they were some old invention; therefore, I think, all new and meritorious improvements or inventions should take the preference, thereby to stimulate improvements on this coast.

Respectfully yours,

C. B. BROWN.

To the Committee on Gold Medals, State Fair, eighteen hundred and seventy-four:

GENTLEMEN: In presenting my claims for the gold medal, for making a large and varied exhibition of manufactured articles, in the line of my business, I would respectfully state that I devoted much valuable time and incurred very heavy expense, in order to get in shape for the display of the following articles, viz:

One laurel and walnut trimmed bedstead.
One dressing bureau, laurel and walnut.
One washstand, laurel and walnut.
One somino, laurel and walnut.
One table, laurel and walnut.
One wardrobe, laurel and walnut.
One office desk, laurel and walnut.

One lounge in brocatel.
One office chair.
One rosewood and walnut bookcase.
Two rosewood side tables.
One marble-top center table.
Two fancy embroidered chairs.
One Turkish sick chair.
One etagere.
One music case.
One chamber set (seven pieces).
One sofa in brocatel.
Two easy chairs, brocatel.
Four parlor chairs, brocatel.
One parlor set in green tapestry (seven pieces).
One parlor set, in blue and brussels.
One twelve-foot extension table.
Two spring mattresses.
One hair mattress.
Two feather pillows.
One looking glass.
One feather bolster.

I would submit the following claim on the society for the gold medal in the Fourth Department:

First—That the manufacture of furniture is of the greatest interest in the prosperity of the State, for the demand is as sure and steady as is the demand for breadstuffs, and sugar, tea, and coffee.

Second—That the workmanship displayed by said exhibition is of the first order, and should receive the greatest commendation from the State Agricultural Society.

Third—That the capital required to carry on his manufacturing shop is necessarily very large.

Fourth—That his business furnishes employment to a large number of workmen, and some highly skilled and expensive artisans find employment in his establishment.

Fifth—That he has in years past devoted time and money in exhibiting articles of his manufacture and workmanship at the different State Fairs, with a view to advance this particular branch of industry.

Sixth—That, aside from the great interest he feels in the award of the gold medal by the committee, he considers the manufacture of furniture as second to no other interest, as all, the rich and the poor, must of necessity pay tribute to this branch of industry; therefore, the great importance to the interest of the State that she should, as far as possible, produce these articles within her own borders. We have in the State people from nearly every country on the globe, and as our establishments increase we will utilize the experience and skill of the foreign element that have cast their lot with us, and that in the near future, by a judicious encouragement, the State of California will successfully compete with her sister States in a great majority of manufactured articles which are required for the happiness and comfort of her people, and, also, the saving of the money which now finds its way out of the State.

Seventh—That he earnestly and respectfully presents his claims to the committee for their consideration.

JOHN BREUNER.

SAN FRANCISCO, October 20th, 1874.

To State Agricultural Society's Committee on Gold Medals:

GENTLEMEN: The Sluthour pump we exhibited at the late State Fair we notice took the premium offered for the best mode of raising water for irrigating purposes; for this we should express thanks. We have now exhibited these pumps at three State Fairs, and believing that no pump has been exhibited in that time possessing the merit these pumps do in point of simplicity, durability, and ease of action, also, for the volume of water for the power required, we feel there is a just propriety in making application or petitioning your honorable committee for a special gold medal; and we take pleasure in calling your attention to the report of Judges at the Second International Industrial Exhibition of the Mechanics' Institute, held at Buffalo, New York, October seventeenth, eighteen hundred and seventy-one, on page ten of our Circular, which we send you to-day; and we have taken the liberty to mark some other matters, which may have some bearing in making your decision. Looking for your favorable decision,

We are, gentlemen, most respectfully, yours,

J. M. KEELER & CO.

SACRAMENTO, September 25th, 1874.

To the committee of the State Agricultural Society which awards the society's gold medal:

GENTLEMEN: I respectfully claim the society's gold medal for the most meritorious exhibition in the Fourth Department. I give these reasons, which I claim are complete: There are nine classes in the department. They include hardware, pianos, furniture, stone and other ware, minerals, etc. Of all these, my entry—the Paragon vapor stove and burner—(lower hall) is the only California invention not heretofore in the Fair and not heretofore competing. It is most meritorious of all in the department, because all the others are luxuries; mine is a useful article, and I can establish it that it does and is all it claims. I therefore make my claim.

Respectfully,

WM. FRIEL.

SACRAMENTO, September 19th, 1874.

To the honorable Committee on Gold Medals:

GENTLEMEN: We have on exhibition a billiard cushion manufactured by P. Liesenfeld & Co., known as the "Combination Steel Plate Cushion," invented in San Francisco, California, and manufactured at same place,

for which we desire to receive the gold medal of the Fourth Department, for the most meritorious exhibition of California manufacture in that department. We claim:

Firstly—That this is the first billiard cushion manufactured in California, after many arduous labors in perfecting its manufacture and competing against Eastern manufacturers.

Secondly—We claim that this cushion, being manufactured from a combination of rubber and steel, and out of several parts combined, will last longer, and be more uniform, and give more accurate angles, than any other cushion heretofore known.

Cushions have always been manufactured in New York, and we are now engaging men to manufacture billiard cushions in California. This cushion was patented May fifteenth, eighteen hundred and seventy-four. The manufacture of billiard cushions is at present very extensive in New York, and our aim is to introduce its manufacture here, and maintain it within California, and if its manufacture meets with success, we can employ a large force of men.

We inclose you a certificate signed by three of the best billiard players of Sacramento, who, for three days, have played on these cushions.

That this enterprise, which is as yet in its infancy on this coast, is deserving of your attention and encouragement, is obvious, and as it attracted the attention of all billiardists, we are willing to leave the matter in your hands, and willingly abide your decision.

For further reference, please refer to inclosed statements.

We remain, yours, very respectfully,

P. LIESENFELD & CO.

To the Gold Medal Committee:

GENTLEMEN: As you are practical business men, you will doubtless award the medal in the Fourth Department to that exhibition which, in your judgment, under the circumstances and at this particular time, promises the greatest pecuniary benefits to the State. Permit us, then, to state that our exhibition was the product of a comparatively new industry on this coast; we exhibited a larger assortment of potteryware, consisting of stoneware, fire-brick, floor and roof tile, terra cotta, Rockingham, and yellow-ware—the three latter articles have never before been successfully made in the State, although frequently tried. This discovery of the material, and the peculiar combination necessary to make them, is our own, and cost us much time, perseverance, and money. The importation of these articles has cost the State millions of dollars, which, through our discovery, may be retained here hereafter. The manufacturing of these articles will give profitable employment to a large amount of capital and labor, and make a home market for our agricultural products, and contribute greatly to the general prosperity of the State. We claim the medal, then,

First—Because of our invention or discovery of a valuable new product.

Second—Because we are making the pottery business a success in its most valuable departments.

Third—By the success we are contributing to the general prosperity

of the State, and keeping among our people thousands of dollars annually that but for us, would go out to pay for imported articles.

Yours, very respectfully,

BERGMAN BROS.,
Sacramento.

San Francisco, December 15th, 1874.

Robert Beck, Esq., *Secretary of the State Board of Agriculture:*

Dear Sir: We claim that our Decker pianos are worthy of a gold medal; especially do we claim it for the grand piano. It is pronounced the finest concert grand, in all respects, ever seen in this State. In finish, material, tone, touch, etc., it has no equal here—the best artists of this city assure us of that fact.

Respectfully,

KOHLER, CHASE & CO.

Sacramento, November 20th, 1874.

To the Committee on Gold Medals of the State Fair:

Gentlemen: We beg to lay our claim before you, for the society's gold medal, for the most meritorious spring bed on exhibition, and base our claims for its being so on the following reasons:

First—Its cheapness—its price being less than any spring bed on exhibition.

Second—Its durability and simplicity—the springs bearing directly upon a tough, elastic, woven wood cover, which equalizes the pressure upon them, and makes thereby a set of bed springs far more durable. The springs, being adjustable from one part of the bed to another with but a moment's labor, further increases their durability. These two causes combined makes a set of bed springs far more durable than any other on exhibition.

Third—The mattress being separate from the bed contributes to its healthfulness and cleanliness.

Fourth—Its lightness, and consequent ease of handling—the cover weighing but seven pounds.

Fifth—The cover being highly elastic of itself, only a blanket is required to make it a cool and delightful bed in warm weather—being an advantage possessed by no other bed on exhibition.

In view of the above facts, and that a good bed is a necessity in every household, and that by the general adoption of this hundreds of thousands of dollars might be saved to the State, we feel that we are honorably entitled to the award of the society's gold medal.

Placing confidence in your justice in your giving our claim your careful consideration, we are,

Yours, very respectfully,

J. B. SHERBURN & CO.

FIFTH DEPARTMENT.

SACRAMENTO, September 21st, 1874.

To the honorable Committee on Gold Medals:

GENTLEMEN: The exhibition of beet sugar manufactured by the Capital Sugar Refinery, and exhibited in the Fifth Department, seventh class, during the State Fair of eighteen hundred and seventy-four, we claim to be the most meritorious exhibition, and desire to receive for the same the gold medal of that department, on the following grounds: We claim, firstly, ours to be the most meritorious exhibition, on the grounds that it is the production of an industry which will shortly develop to such an extent as to place California on an equal footing with foreign countries as to its exportations of sugars. Time will but lend additional vigor to a now paying institution, and the agriculturists of the State will thereby receive a new article for production, namely, the cultivation of sugar beets. Secondly, we claim the sugars exhibited by us to be secondary to none in the world, and therefore a perfect article of production.

The sugar-making interests we prove to be one of the most important of our home productions, and will, in the course of time, furnish labor for thousands of men who depend entirely upon their handiwork for subsistence.

That this enterprise, which is as yet in its infancy on this coast, is, therefore, fully deserving of your attention and encouragement, is obvious. We therefore respectfully submit our claims for the gold medal to your good judgment.

Very respectfully, yours, etc.,

CAPITAL SUGAR REFINERY,

Per A. J. WETZLAR, Secretary.

To the officers of the State Agricultural Society:

GENTLEMEN: I here submit to your kind consideration my claim to the society's most distinguished gift—the gold medal—for the most meritorious exhibition in the Fifth Department. In my exhibition is

represented forty-one varieties of fruit, all of California production, each two jars entirely differing from the others; also, fifty-six varieties of fruit jellies; and for the making up of this large variety of jellies, I have been compelled to gather in my fruit from almost every part of the State. The wild plum of the mountains has by me been placed side by side with the orange, lemon, and citron of the southern part of the State. Besides the fruits and jellies here presented, are forty-one varieties of pickles, prepared and put up in the most perfect manner, as you have had the opportunity of seeing. Now, gentlemen, in regard to the merits of this exhibition, I look upon it as something of more importance than merely a display of so much luxury and home comfort; I consider that the public are, in great degree, benefited by the making up of these condiments. The grocer, the crockery dealer, our glass manufactories, and sugar refineries and manufactories, all come in for their share of benefits. When we think of the thousands of pounds of sugar consumed annually in the preserving of these fruits, we must admit that it is a matter of more consequence than merely an exhibition of a few delicacies. Now, gentlemen, I leave the merits of my claim entirely to your judgment. I wish, however, to thank the officers for their kind liberality in giving my exhibition so liberal an amount of premiums.

MRS. H. CRONKITE.

SACRAMENTO, October 21st, 1874.

To the Committee on the Award of Gold Medals:

GENTLEMEN: We claim that we are entitled to the award of the gold medal in the Fifth Department, for the following reasons:

First—We displayed the largest variety of vegetables, being no less than one hundred and eleven varieties.

Second—For the reason that we spared neither time or money in selecting the choicest growth of each distinct variety.

Third—Because our display was the neatest, as well as the most artistically arranged.

Fourth—That we had the largest display of any kind in the Fifth Department.

All of which is most respectfully submitted.

DE BERNARDI & SELNA.

SACRAMENTO, October 24th, 1874.

MR. CAREY, *President of State Agricultural Society:*

DEAR SIR: Having made a very large display of vegetables, also a great many kinds, at late Fair, and feeling that I am entitled to a gold medal, I take the liberty to ask you to take such steps as will procure the same for me, and very greatly oblige,

Yours truly,

FELICIA GABRIELLA.

SIXTH DEPARTMENT.

SAN FRANCISCO, December 15th, 1874.

MAJOR ROBT. BECK, *Secretary State Agricultural Society, Sacramento, Cal.:*

DEAR MAJOR: I had on exhibition for this company, at the recent State Fair, a full line of Alden goods, which articles were entered for the gold medal, and not for the cash premiums, in the Sixth Department. The committee, in their report, a copy of which is before me, express themselves highly pleased with our exhibition, which they deem worthy of special mention, and recommend the awarding of the gold medal.

Being convinced that the Alden process possesses great merit and will prove of incalculable value to this State, if properly conducted, I renew my application for the gold medal, and trust your "Society will give to this new and growing industry every possible encouragement." Will you please present this application to the proper committee, and advise me of their decision, and oblige,

Very respectfully,

GEO. W. DEITZLER.

—

As we had no raisins on exhibition, none having been made at the time of the Fair, I send a caddy from the Vacaville factory for examination. These raisins have neither the color nor the flavor of the imported article, but good judges have pronounced them excellent raisins. Such raisins can be placed upon the market at a cost not exceeding six cents per pound, including the cost of raising the grapes.

GEO. W. DEITZLER.

To the Committee on the award of the Gold Medal:

We would respectfully enter our claim for the gold medal, to be awarded for the most meritorious artiele displayed in the Sixth Department, upon the following grounds: We would claim for our "Tamiama Bitters," or "Wine of Life:"

First—That there is less alcohol used in its composition than in any of the other wines, brandies, or spirituous liquors exhibited in this class or department.

Second—That it is composed of purer and better materials than any other class of bitters or tonics in the United States, as has been shown by actual analysis—experienced chemists and skillful physicians declaring that there is nothing deleterious to the human system in it.

Third—We would claim that the merit arising from its efficacy in the cure of diseases of the kidneys and urinary tract and bladder, sterility, and loss of vital energy, is superior to all the merits combined in any other article displayed in this class or department. This great compound

of Mexican herbs has, from time immemorial, been held almost in veneration by the native Indians of Northern Mexico for their life-renewing qualities, and regarded by them as a great specific provided by nature against the above named diseases. These wonderful vegetable productions, of which this tonic is composed, have engaged the attention of the medical savans of London, Paris, and Berlin. Their virtues have been tested and certified to by the highest names in the faculties of those cities. Its virtues are chiefly directed to the genito-urinary organs, and diseases resulting therefrom. Married persons, conscious of inability from whatever cause, will find this tonic a thorough regenerator of the system. When want of offspring is a cause of regret it is of inestimable value. It will renew the health of those who have destroyed it by sexual excesses or evil practices; increase and restore the appetite; induce continual cheerfulness and equanimity of spirits, and prolong life.

We consider, gentlemen of the committee, the above statements ample reason for our claiming the gold medal, if we can substantiate them. We have made no empty brags about the merit of our Tamiama Bitters, but have only asserted what we consider the simple truth. We have called the attention of such experienced and well known physicians as Drs. Cluness, Hatch, and others, of Sacramento, who have expressed themselves in unqualified terms of admiration and approval. In every identical instance of their having been used in experimental cases, the consumers have expressed themselves thoroughly satisfied as to the efficacy of our tonic to fulfill all we claim for it.

It is no patent medicine or clap-trap cure for all the ills flesh is heir to, and we claim no desire to be ranked among the many venders of such nostrums. We trust our standing and reputation as business men is sufficiently well known to protect us from any such imputation, and will be sufficient guarantee that all our statements can be substantiated.

Trusting that you will see sufficient merit in our "Tamiama Bitters" and "Wine of Life" to award us the gold medal, we remain, gentlemen of the committee,

Respectfully yours,

POWERS & HENDERSON.

SACRAMENTO, September 25th, 1874.

To the honorable the Board of Directors of the State Agricultural Society of the State of California:

GENTLEMEN: The undersigned, one of the contributors to the State Fair of eighteen hundred and seventy-four, hereby applies for the gold medal to be awarded in the Sixth Department, as per catalogue represented. I claim the award of said gold medal on the exhibit of the best wines grown in the State of California, manufactured by myself in person, said wines having been manufactured by a new process, to wit: by being concentrated by means of dry heat, the wines being kept at

one hundred and sixty degrees Fahrenheit for a period of forty days or thereabouts, thereby rendering them ready for market, rich and mellow, in much less time than by the usual process. Seventy-two barrels of these wines are now lying in Governor Stanford's storehouse.

I further claim said award on the best and richest brandy, made from grapes, which I also had on exhibition at said Fair, said brandy commanding one half greater price than any other brandy made in this State, being manufactured by myself, through one of Johnston's patent stills (the first ever made), which leaves it free from fusil oil or acetic ether, leaving a rich, smooth, soft brandy, both pleasant and wholesome.

All of which is most respectfully submitted for your consideration.

B. N. BUGBEY,
Proprietor of Natoma Vineyard.

LINCOLN, December 8th, 1874.

ROBERT BECK, *Secretary State Agricultural Society:*

MY DEAR SIR: I received your kind letter of November third, informing me that I must present my claim in writing for the gold medal, before the nineteenth instant, and to state in what department. As I have no premium list at hand, of course I forget, but it is in the green fruits. I hope you will substitute the department for me.

I claim the medal on the ground of the largest and most meritorious display of fruits, especially grapes, more particularly in the discovery and improvement in pruning, so as to produce the largest amount of good grapes. This discovery, I am satisfied, will work a great revolution in the culture of the grape in California, increasing the product tenfold, with less labor and less liability to frost in the early Spring or sunburn in Summer, and less liable to mildew or grape fly. This, of itself, I think, is sufficiently meritorious to claim the medal, without having exhibited the best display of fruits at the Fair this year.

Yours, respectfully, J. R. NICKESON.

PLACERVILLE, December 7th, 1874.

MR. ROBERT BECK, *Secretary State Agricultural Society:*

DEAR SIR: I received a note from you requesting me to present my claim for the gold medal in writing. I claim the society's gold medal in the Sixth Department, for the most meritorious exhibition and best general display, embracing the best and greatest varieties of fruits, for which the award books will show.

Yours, respectfully, I. S. BAMBER.

SEVENTH DEPARTMENT.

San Francisco, December 16th, 1874.

To the Committee on Award of Gold Medals for eighteen hundred and seventy-four:

I hereby enter a claim for the medal of the Seventh Department—fine arts—on the ground of having made the best exhibit at the late Fair, the committee awarding me the premium for "best exhibit by one artist." At the time of entry, I also laid claim to the medal, but I notice a request in the papers requiring a written statement by exhibitors, and I hasten to comply.

Respectfully yours,

NORTON BUSH.

Sacramento, November, 1874.

To the Gold Medal Committee:

Gentlemen: Having made an exhibit of twelve landscape paintings in oil at your State Fair this season, nine of which were original studies of California scenery, and none of which have previously received your society's premium, and having taken the honor at the hands of your Judges of the highest premium awarded in the art of oil painting, namely: for the best painting in oil, including the best landscape in oil, I feel justified in making claim to the gold medal of your society for the same.

Very respectfully,

F. JAY LEWIS.

Sacramento, December 10th, 1874.

To the Committee on Award of Gold Medals of the State Agricultural Society:

Gentlemen: We wish to submit the following as the principal reasons for our claim to the gold medal in the Seventh Department:

First—We had a larger and better display than was ever made in this or any other State Fair in the United States, so far as our information goes.

Second—We exhibited Vermont, Italian, and California marble.

Third—The variety of our work exceeded our display of last year one hundred per cent.

Fourth—All our work was first-class, and would bear criticism from any source.

Fifth—We had more money value in the exhibition than any other in mechanical arts in the Fair.

Sixth—We fully carried out our promise to make a better display in work and material than the year eighteen hundred and seventy-three.

Seventh—The monuments were all of original design.

Eighth—Our exhibition of sculpture of lambs, dove, rose wreath, female bust, and statues, were of a class and style of work that would compare favorably with the production of any artist.

Ninth—The display of lettering and gravestone carving was equal to any work done in the State.

Tenth—The principal portion of our display was from California material, and the different styles and designs in which it was wrought manifest that California is as far ahead in her marble as she is in all her other natural productions.

All of which is respectfully submitted.

AITKEN & LUCE.

SACRAMENTO, September 25th, 1874.

To the honorable Board of Directors of the State Agricultural Society and Committee on Gold Medals for eighteen hundred and seventy-four:

GENTLEMEN: My entries under miscellaneous exhibits were made for special gold medal. I base my claim upon such under the following considerations:

First—I claim to make the most mechanical, useful, and expensive exhibit under the miscellaneous department which were my own (California) invention, and nearly all constructed by my own hand.

I therefore, gentlemen, most respectfully ask the award of special gold medal upon my patent Oyster Propagator and Nursery, upon the grounds of its great commercial importance to the Pacific Coast. Since the early period of history the oyster has constituted a most important luxury, and we, as a State, keenly feel the unfortunately remote natural location of the favorite bivalve. Undaunted by this, at great expense thousands of barrels of young oysters are yearly imported to the coast; these we transplant and receive most rapid growth, proving that in fatty material the coast bays afford superior advantages; but in matter of propagation the natural surroundings are such reproduction has heretofore been found impossible. By my invention I place my breeding oysters within artificially prepared estuaries, mechanically constructed against all possible escape of the young oysters, until they have located or attached themselves upon shell, or other substances artificially provided for, which then can be removed to growing beds, in which the coast bays afford unusual advantages.

This is the only patent for the purpose in the United States, and for it I claim a decided advantage over natural beds by guarding against the escape of millions of young oysters, which are carried out at sea by the outflowing tide, beyond shelly formation, necessary to their safety; consequently they should reach market at prices equal to those of natural localities, and absolutely save to the State the import of that important demand.

I would likewise ask special gold medal awarded upon my patent Charnel Vault Disinfecting, on the grounds of its being the most import-

ant sanitary invention ever produced, and the only one ever patented for that purpose.

From principle I am a strong advocate of cremation, which will in time become universal, but the popular indignation over a proposition to burn the dead will not subside during the present generation; consequently the laws of health immediately demand some means to obviate that most pernicious evil of depositing in charnel vaults human bodies subject to decomposition above ground, which this combination completely overcomes, as the promptings to this investigation have ever been a desire to do the greatest good to mankind. I therefore offer, as a California invention, all the accredited results of my humble labor, for which her recognition, through your honorable society's gold medal, would ever remain most truly respected.

Next in order comes my patent embalming process, with its unprecedented apparatus, which likewise has claims upon your consideration. Not as a necessity, neither has it claim upon health or commercial development of State; it simply claims its superiority over all processes for like purposes, either in this country or Europe, which numberless testimonials from home and abroad have long since proved.

Inclosed will be found a few out of many, selected because well known.

I remain, gentlemen, yours, with much respect,

BENJ. F. LYFORD, M. D.

REPORT OF GOLD MEDAL COMMITTEE.

We, the committee appointed to award the gold medals, beg leave to report as follows:

FIRST DEPARTMENT—LIVE STOCK.

The gold medal in this department was awarded to Major Jeff. Bridgford, of Missouri, for his herd of short-horned Durham cattle.

SECOND DEPARTMENT.

To Carvill & Co., San Francisco, for carriages.

THIRD DEPARTMENT.

To Stone & Co., for harness.

FOURTH DEPARTMENT.

To Sacramento Pottery, Bergeman & Co., for pottery.

FIFTH DEPARTMENT.

To Sacramento Valley Beet Sugar Company, for sugar.

SIXTH DEPARTMENT.

To Alden Fruit Preserving Company, for fruit dryer.

SEVENTH DEPARTMENT.

To Aitken & Luce, for marble work.

H. M. LARUE,
DUNCAN BEAUMONT,
JOHN McNEIL,
DR. CLUNESS,
DRURY MELONE,
LEW. WILLIAMS.

REPORTS OF SPECIAL COMMITTEES.

ALDEN FRUIT DRYING COMPANY.

To the honorable Committee on Awards of Gold Medals:

Your committee beg leave to report, that in examining the dried fruits on exhibition, they were highly pleased with the excellent quality and great commercial value of the fruit and vegetables entered by George W. Deitzler, President of the Alden Fruit Preserving Company of California. This fruit is not *dried*, in the common acceptation of the term, but is preserved in its own juices by the peculiar process, and it is claimed will keep for years in any climate.

The flavor of the fresh fruits is retained, and it is free from the dark and leathery appearance which is found in sun or kiln-dried fruits.

The committee have no hesitation in expressing the opinion, that as regards taste, flavor, and appearance, these articles are equal to, if not the best, on exhibition.

The commercial value of such fruits and vegetables is very great. California can produce in unlimited quantities the finest fruits and vegetables in the world; and it is equally well known that we have not the resident population to consume these immense productions in their fresh state, and they will not bear transportation to distant markets; neither can we hope to find a remunerating market for inferior dried fruits and vegetables at home or abroad, but for such preserved articles as those under consideration, there is, it seems to us, no danger of overstocking the market, when we consider that there are imported into the United States over fifteen (15) millions of dollars worth of dried fruit, all of which articles can be raised in California, and placed upon the markets in a cured condition infinitely superior to the imported articles.

In view of these considerations, we deem our articles on exhibition by the Alden Company as worthy of special notice, and respectfully recommend that the Board of Directors award to the company the gold medal, and give to this valuable and growing industry every possible encouragement.

W. C. HOPPING,
ALFRED BRIGGS,
W. R. STRONG.

WINES AND BRANDIES.

SACRAMENTO, September 25th, 1874.

To the President and Directors of the California State Board of Agriculture:

Your Committee on California Wines and Brandies, in the Sixth Department, beg leave to report that they have awarded premiums as follows:

To B. N. Bugbey, Folsom, for best grape brandy, vintage of eighteen hundred and seventy, twenty-five dollars.

To B. N. Bugbey, Folsom, for best white wine, dry, vintage of eighteen hundred and seventy-three, twenty-five dollars.

To B. N. Bugbey, Folsom, best red wine, dry, vintage of eighteen hundred and seventy-two, twenty-five dollars.

To Robert Chalmers, Coloma, for best sweet wine, green Hungarian, vintage of eighteen hundred and seventy-two, twenty-five dollars.

To Mrs. H. Cronkite, Sacramento, for best port, twenty-five dollars.

To B. N. Bugbey, Folsom, for best sherry, vintage of eighteen hundred and seventy, twenty-five dollars.

To Robert Chalmers, Coloma, for best angelica, vintage of eighteen hundred and seventy-two, twenty-five dollars.

To W. S. Manlove, Sacramento, for best sample of grape syrup, ten dollars.

There being no sparkling wines on exhibition, your committee would recommend that the twenty-five dollars not competed for be given as a special premium to J. H. Carroll & Co., for their exhibition of Reisling wine; and, also, recommend for special mention, the Catawba Wine Bitters, exhibited by Robert Chalmers, Coloma.

NICKESON,
CLUNESS,
MOTT,
Committee.

SILK AND WOOLEN GOODS, ETC.

Best display of woolen goods by one factory; premium, one hundred dollars; awarded to Sacramento Woolen Mills. Sylvester Tryon, Manager of these mills, made a fine and valuable display of goods, excellent in quality and superior in finish. Blankets, tweeds, cassimeres, flannels, doeskins, waterproofs, and other woolen fabrics, were displayed in creditable profusion, and nothing seemed imperfect or poor, either in the stock used, the workmanship applied, or the taste manifested.

Best Mackinac blanket; premium, five dollars; awarded to the Sacramento Woolen Mills.

Best ten yards of rag carpet; premium, ten dollars; awarded to Alexander Mackay, San Francisco. The goods are excellent.

Best exhibition of shoulder-braces and corsets—silver medal—awarded to M. Kraker, Sacramento.

Best display of fancy goods—twenty dollars—awarded to M. Kraker, Sacramento.

Best hearth-rug; premium, five dollars; awarded to Mrs. J. F. McDermon, Sacramento.

In making this award, the committee found it difficult to decide between the work of the different exhibitors, and recommend that Miss A. Hubbard, of Sierra Valley, California, be given a special premium for a hearth rug, beautiful in design and very finely made; also, that Mrs. J. F. Hill be given a special premium, for a meritorious display of rag-rugs—five in number—as well made almost as is possible, and showing fine taste in their maker.

Best exhibition of silk goods by one factory; premium twenty-five dollars; awarded to Joseph Green, Oakland, California.

This display of silk goods comprises one hundred and eleven pieces of ribbon, of every shade and tint, and of very superior workmanship and finish. Your committee desire to respectfully suggest, in view of the magnitude and importance of the silk interest, prospectively, in California, that the premium in this instance is a small one, and could, with propriety, be made larger and more encouraging to the present exhibitors as well as to future ones. Mr. Green brought to this State forty years experience in the manufacture of silk and other ribbons, and this exhibition of lute-string, gros-grain, double shot gros-grain, and other kinds, is not only attractive and creditable, but is also suggestive of what may be produced hereafter. The factory at Oakland has now been in operation nineteen months, and certainly this result of its operations may well attract the critical attention of the State Agricultural Society. The looms, shuttles, and the machinery for winding, wraping, fitting, and blocking are now in constant operation, and your committee report the work to be well done, beautiful in appearance, enduring in quality, tasteful and valuable, and significant of the probability that goods of this description can be as readily and as successfully made by the bay of San Francisco, on the banks of the Sacramento, as in the "Lyons Looms," and it is recommended a silver medal be awarded to Mr. Green.

J. T. GRIFFITTS,
L. E. CRANE,
MRS. H. ADAMS,
MRS. H. H. PIERSON.

CALIFORNIA SARDINES.

To the honorable State Board of Agriculture:

GENTLEMEN: The undersigned members of a committee appointed to examine and pass upon the merits of the California sardines, as cured and packed in oil by the California Sardine Company of San Francisco, would respectfully report:

In treating of this new interest, too great importance can hardly be attached. The generally accepted idea that the genuine sardine can be found but in the waters of the Mediterranean has been exploded, and our bays, harbors, and inlets from the Pacific Ocean swarm with sardines, which can be had almost for the asking. Italian fishermen pursuing

their vocation at San Francisco, declare that the fish are the genuine sardine, possessing more delicacy of fibre than those obtained in Europe.

A late authority says that the sardine is a small and well known fish of the herring family. It is regarded by some as identical with the fish called the pilchard, of the coasts of Great Britain, though Cuvier made it distinct, giving it the specific name of *sardina*.

On exhibition, on the lower floor of Agricultural Hall, is a display of California sardines in tin cases of two sizes. They are the product of the California Sardine Company of San Francisco, and are exhibited by ex-Senator T. N. Wand, one of the leading men of the company, and to whom we are indebted for some facts in relation to this new and important enterprise.

Some time last Spring, a few gentlemen having satisfied themselves that the true sardine was an inhabitant of the Pacific Coast, also knowing that California is a great olive-growing country, and that if the presence of the fish could once be established, the copious production of native olive oil would soon follow, the determination being to give the matter a thorough and practical test. Machinery was ordered from the East, arrangements were made for the importation of oil, and everything necessary for pushing the new business to a success or a failure was resorted to, but owing to the delay always attendant upon the introduction of such a new enterprise, they did not get to work till late in the season, and now for the first time the California sardines are laid before the public through the medium of the State Fair.

Being now assured of entire success, the company will soon have arrangements completed to work next season on a large scale. The fish run about seven months, commencing in March. When we consider that they have the whole United States for a market, and that several millions of dollars worth of sardines are annually imported from foreign countries and consumed in our own, it is at once apparent to the average mind the importance of this heretofore unthought of source of California wealth.

Your committee carefully examined, touched, and tasted the samples submitted to them, and they have no hesitation in certifying that they have found the fish neatly and artistically put up in boxes, and, what was of still greater importance, they found the quality of the fish, in points of sweetness, tenderness, and delicacy of flavor, fully equal, if not superior, to the imported article; in fact, they are the finest sardines we ever tasted, and we take the greatest pleasure in advising our citizens to encourage this pioneer sardine company in the prosecution of a business which must undoubtedly in a few years assume such proportions as to add largely to the wealth and prosperity of California, the cherished home of our adoption.

W. W. LIGHT,
D. S. ROSS.

ANNUAL ADDRESS.

ANNUAL ADDRESS.

DELIVERED BEFORE THE STATE AGRICULTURAL SOCIETY OF CALIFORNIA, AT SACRAMENTO, SEPTEMBER TWENTY-THIRD, EIGHTEEN HUNDRED AND SEVENTY-FOUR.

By MORRIS M. ESTEE.

Mr. President, Ladies, and Gentlemen:

The topography of California presents a greater variety of scenery, the soil and climate offer opportunities for a larger variety of production, than any other place under the dominion of civilized man. The sublime and beautiful sit upon either hand of us; our mountains are capped with perpetual snows; our valleys are perfumed with perennial flowers. The sunshine and the storm come at stated periods, so that we know when to expect the one, and when to prepare for the other. Yet, this is not a land of enchantment. That which is worth having here must be earned as it is elsewhere. The reward is not all due to climate and soil. Much is due to labor. California is an originality in climate, soil, and people. She stands alone among her sisters of the Union—alone in her greatness and in her weakness, walled in by mountains and by sea, and with resources not half developed. She furnishes more money and more bread to more people by less actual labor than is produced by any other like number of persons on the habitable globe. I pause in the consideration of this wonderful prosperity, to ask how much of this is due to the country, and how much to the people? There are countries and climates which would seem to be more favored by nature than the State we live in. We have all read of the charming islands in the great sea which washes our State upon the west, where nature does all the work, and nothing is left to man but to enjoy; where his food and his clothing come to him almost unsought, and a voluptuous climate renders shelter unnecessary.

But this is not the life for which man was designed. The great Creator, who endowed him with quick thought and skillful hand, did not intend he should pass the time in slothful inaction, the idle and contented consumer of His bounty.

If proof of this be needed, the history of our race supplies it. The conquerors of the world have come from the stern and rugged north, where existence must be battled for and life without labor is impossible. With ease have come effeminacy and indulgence.

The indolent races inhabiting the tropics have cut no figure in the story of the world. No great names have risen above the dead level of their national insignificance to act as beacon lights to posterity, and nation after nation has passed away, leaving no impress upon the land they occupied but never benefited.

In countries like the one described, man's mission is ended with his existence; there he performs no great deeds, he builds no cities, he establishes no new and beneficent systems, he makes no progress on the road to knowledge, possesses no love of wealth, no inspiration of religion, no thirst for truth. Nothing can turn him from the narrow benighted customs of his fathers. The very land he inhabits, the air he breathes, and the sun that shines upon him, seem to encourage his dreamy lazy life.

While a balmy climate and productive soil are of infinite value to an enlightened industrious people, the most favored places of nature for the development of the highest type of manhood are where man must work or die. There men rise to the highest stage of civilization; and there more is due to the man than to the country he lives in; for, after all, the noblest gift which the Creator has given us, is the impulse and the power to become ourselves creators, and just so far as we succeed in this, so far have we performed the great and solemn duties imposed upon us. Nor does the obligation rest more heavily upon the tillers of the soil than upon the statesman and educator. Each in his own sphere and in his own way is called upon to act his part upon the side of honesty and progress, in public as in private life.

Among the duties imposed upon us, and to which I shall especially call your attention, are those that have a direct reference to the development of the resources of the State; for even in the presence of the wonderful advantages this State affords, labor and enterprise and intelligence must be called into activity to develop them. In an age of peace, no people can become great and prosperous unless agriculture is made its chief pursuit.

It is the cornerstone of every national structure. It is the foundation of national, as it is of individual, wealth.

The greater the production the better the market. For now every farmer has the world for a market, and the whole people never yet had enough to eat.

The question is, how can we best develop these resources?

In my opinion, the highest and best cultivation can only be obtained by

IRRIGATION.

It has been said that he who makes two blades of grass grow where one only grew before, has benefited his race more than the most successful General.

I submit that simply doubling the production in this State, will not be half the increase, where land is irrigated. But before dwelling upon this branch of the subject, many inquiries of grave importance, and some of doubtful solution, present themselves to be answered. Irrigation has been successfully practiced from the earliest historic times. It was old when the Pyramids were new. Irrigation made Egypt the

granary of the world, and to-day the valley of the Nile produces two and three crops a year, one or two of them by irrigation only, and that irrigation of the rudest and simplest character.

In China, in Italy, in Spain, in India, and in some parts of France, irrigation dates back to the commencement of land culture.

It commenced in necessity, and has been pursued ever since for profit. It is not an experiment, resting upon the future to prove its advantages or uselessness, but a success, tested by the most careful inquiry, made by the most civilized nations of the world. These experiments have been so numerous and so varied, that they give us authority upon every side of this, to us, intricate problem.

CLIMATE AND IRRIGATION.

In general, irrigation will not succeed where the Winters are long and cold; indeed, it has been shown that only in such mild and balmy climates as Egypt, Italy, Spain, India, and California, will irrigation prove successful. This arises from the facts:

First—Where there is hard freezing, the ditches and canals require expensive repairs every Spring before using.

Second—That when the Winters are long the Summers are short, and the soil so moist that irrigation is not required.

Third—Irrigation will not in general pay, when but one crop can be raised in a year.

HAS CALIFORNIA SUCH A CLIMATE?

We have in this State over two hundred cloudless days in the year, and, according to the statistics furnished by Mr. Hittell, in his admirable work on the Resources of California, on an average not over sixty rainy days.

In San Francisco the difference between the average temperature of July and January is only eight degrees, in Monterey six, in Sonoma twenty-one, in Sacramento twenty-eight, and in Santa Barbara eighteen; while in New York it is forty-two, in Naples thirty, in Genoa thirty-one, and in Algiers twenty-three.

In San Francisco the average mean temperature in January is forty-nine degrees, in Los Angeles fifty-two degrees, in Sacramento forty-five degrees; while in Naples it is forty-five degrees, in Genoa forty-six degrees, and in Algiers fifty-two degrees. It will thus be seen that our climate is the perfection of all that Providence has bestowed upon any land.

Our Summers are long and rainless, grain never rusts from moisture, nor is labor ever stopped by storms. We have neither snow nor ice to retard cultivation. There is not a day in the year that grain cannot be sown, if the land be moistened by rain or artificial means.

Our Winters, under our present system of dry culture, are our seasons for planting, and May, June, and July for harvest.

By irrigation an enormous crop of wheat, barley, oats, or hay can be raised in the Winter and Spring, and in the Summer, corn, potatoes, tobacco, cotton, and garden vegetables.

There will be no limit to our production under a system of irrigation as extensive as that in India, Italy, or Egypt.

It may be safely admitted that no place where irrigation is extensively practiced is as well situated in all respects as California. In the universe of God it is said there are no accidents.

In the gift of these transcendent qualities of climate and soil to California, it would seem that a benign Providence intended to close man's migratory circuit of the earth in a land laden with His bounty. These marvellous gifts are inert. Labor must develop them; nature will not. Nothing but sturdy enterprise and unvarying purpose can accomplish this to its fullest end. If accomplished, the story of our growth will be more wonderful than the dreams of oriental fancy. No such treasure was ever before committed to man. None will be more unwisely wasted if we permit it to go undeveloped.

THE EXPENSE OF CANALS.

The cost is one of the problems connected with this subject which is difficult of solution. The same grave question met De Witt Clinton when he commenced the construction of the Erie Canal. It came face to face with M. De Lesseps when he gave inspiration to the Suez Canal. Yet these were made, and canals for irrigation and transportation will be constructed through the great valleys of this State within the next twenty years, large enough to transfer the waters of the Sacramento and San Joaquin Rivers, the Tulare and other lakes out upon the plains, *if it will pay for the investment.* Money is conservative; and before one dollar of private capital will be put into such a great enterprise, it must be made to appear that it will be remunerative.

The cost of some of the irrigating canals of Italy and India is enormous. From careful estimates made in the construction of the Ganges, Bora, Doab, Sutly, and Soane Canals of India, it seems that a canal with a capacity to irrigate seventy-five thousand acres or more, will cost what would amount to thirty-five dollars per acre for the entire district irrigated. This includes side channels (the side channels often cost more than the main canals).

The first seventy-five miles of the Madras Irrigating Canal cost forty thousand dollars per mile. This canal is one hundred feet wide and eight feet deep.

The great Ganges Canal cost twelve million dollars. Its length, including branches, is nine hundred miles. The branches comprise the larger part of its length; width, one hundred and seventy feet; depth, ten feet; and it will irrigate one million five hundred thousand acres. The cost is much less per acre than the above estimate. Some of the canals in Italy are lined with solid masonry, with locks of the most massive character, and they have been in actual use for centuries. I am persuaded, after comparing the expense of irrigation in Italy and India, that twenty dollars per acre will be a fair estimate of all expense for making channels large enough and long enough to transfer all the waters of the Sacramento and San Joaquin Rivers, which is not required for navigation, the Tulare, Tahoe, and other lakes. The cost for irrigating two million of acres would be, say forty million dollars. This amount of money, thus expended, seems enormous; but it must be considered that the making of such gigantic works would extend through a quarter of a century, and it presupposes a largely increased population, and still larger increase of wealth.

This question of cost is certainly the most debatable problem the subject presents.

Yet other people, not more enterprising, not more wealthy, and not as favorably situated as we are, have not hesitated to expend greater sums than this for a like purpose. For instance, by a report published

in London as recent as September fifth, eighteen hundred and seventy-three, it appears there has been expended by the Government in India on irrigating canals what in our money would amount to fifty-one million forty-five thousand dollars, and that at this time similar works in India are in course of construction, which will actually cost fifty million five hundred and eighty thousand dollars in addition. More than half of this sum is to be expended within the next five years.

The English are a cool, calculating, money-making, and money-saving people. India has been the great source of their wealth for the past century, and it seems destined to be for the next century.

THE OWNERSHIP OF THE WATER.

In most countries where irrigation has proven successful, the ownership of the water remains in the sovereignty, and the sovereignty either grants the right to its use to canal companies, or makes the canals and rents water to those desiring to irrigate. Our American law of riparian ownership, and the recognized doctrine that each navigable stream is a highway, open alike to the use of the whole people, and especially the ease by which private parties acquire title to great watercourses, will necessarily cut a large figure in the disposition of this important question. If the State owned and controlled the fee to all our watercourses, so that no private enterprise or individual could acquire a legal right to any of the waters, any more than they could to a public highway, then terms could be imposed (the fee remaining in the State), so that large inducements could be offered to private capital to invest in irrigating canals, while a reasonable and just protection against monopoly was assured to the people.

There is still another view which presents itself for consideration. The right to the use of a reasonable amount of water is incident to the ownership of the land adjacent to it, and neither the State, nor any individual or corporation in the State, ought to be permitted to divert and take from its natural channel, or from the valley through which it runs, the water of any of the streams of the State, if it be needed there; but the amount only that is needed should be retained for riparian owners. To say that the waters of the San Joaquin may be transferred from that great valley, and used for the purpose of irrigating lands located either all upon the one side of the river or remote from it, when it is required there, will be to admit that the people of one portion of the State may do an act which will deprive the people of another section of the means of subsistence.

Yet the riparian ownership should be limited to the amount of water that is actually needed.

The man who owns the right to an article like water, in a climate like ours, without taking any steps toward a useful appropriation of it, is as great a monopolist as he who owns the water and uses it as a means of oppression.

In a country like this, where a large portion of the year is rainless, a monopoly of the water is as dangerous to the prosperity of the country as a monopoly of the air we breathe; and yet, when we reflect that it requires the expenditure of a sum of money greater far than any estimate has hitherto been made, to dig canals through our valleys large enough and permanent enough to answer the purposes of irrigation on

a grand scale, we can realize how difficult it is to avoid a monopoly of this character; for every exclusive right necessarily amounts to a monopoly.

What can be done, and ought to be done, is to regulate its use and its price by legislation; not to prohibit or limit its use. There is a labor side to this question that can be only protected by legislation. Labor is weak and divided, and must be protected. Capital is strong and united, and can protect itself. The people, at this time, would undoubtedly object to the State, or the counties of the State, taking an interest in this enterprise. The subject is new to us; the profit not understood, or at least uncertain; the work vast and expensive; the interest local, as it could afford but a small advantage to the mining counties; therefore, private capital must be chiefly looked to for this purpose.

Already, some of the most wealthy, shrewd, and enterprising business men of the coast have given this subject a start in the right direction.

They have, with the usual forethought and care of large moneyed interests, examined every side of it that I am presenting for your consideration, and have thus early mapped off a system of irrigation for at least one of the great valleys of the State (the San Joaquin), of the most comprehensive character.

This has been contemplated simply as an investment. Money is rarely public spirited or patriotic. It moves in the channels of good investments and large interests. It is a mistake of its possessor if it gets out of these channels. You may therefore rest assured that these capitalists knew the value of this enterprise before they embarked in it.

As before stated, in Northern Italy, as in India, the Government possess the right of property in all running waters. In Lombardy, grants of the water in perpetuity have been made; but, says Captain Baird Smith, who is a standard authority on irrigation: "The grant of such material as water, the value of which must necessarily go on augmenting with the progress of agriculture, irrigation is an act of injustice toward the Government and people. * * * * Hence I am distinctly of the opinion that for the Government of India to follow the example of Lombardy in parting forever with its right of property in the waters of the country on receipt of sums which cannot possibly represent the real value of the article, would be unwise, not only as regards its own interests, but also those of the irrigating community. For there is no point better established by experience in Northern Italy, and particularly in Lombardy, than that the selfishness of the grantees of water in perpetuity has been one of the most serious obstacles to the development of irrigation."

"Acting on the principal that they had a right to do what they liked with their own, they were in the habit of arbitrarily suspending the supplies of water to some, of increasing as they saw fit the prices to be paid by others, and in a word pushing to its utmost limits the right of absolute property purchased by them from the State."

"But an agriculture," continues our authority, "founded under such an arbitrary system, cannot advance."

M. Giovanitti, a distinguished Italian lawyer and statesman, traces with a master hand the history of property in water in Italy; and after showing that the State claimed no property, as such, in the bed of the river or islands, he says: "Nor does the State claim the water as a patrimony for the community, but simply to place beyond the reach of private appropriation all that was naturally designed for the common good."

As respects California irrigation, this in time will be another of the problems of doubtful solution. Here, under our laws, the ownership of the water of the unnavigable streams of the State can be acquired by the first appropriator. No legislation at this time could change this rule or afford an ample remedy, for much of the water is already in private hands.

The only power, then, left in the State, and one which sooner or later it must exercise, is to regulate the use and the price of water for irrigation, not with the view of making the property in water less valuable, but to avoid oppression and discrimination, and thus make it, like all public enterprises, of value to the whole people.

It has recently been held, by the highest judicial tribunal in Italy, "that canals of irrigation are not to be regarded as works designed solely for the benefit of their original constructors, * * * but that the general good of the community has to be considered, as well as the benefit of the individuals running them."

No sensible man will countenance the lawless idea that what a man owns is not his to enjoy, be it much or little, but it is the part of wisdom to profit by the experience of the past, and, so far as possible, protect by law those who cannot protect themselves, and thus guard with a jealous eye the best interests of the producers of the State.

In this State and in this climate, if we should give to any one set of individuals the fee of the waters of the State for irrigation, whether such persons live upon the banks of rivers or remote from them, and the State have no right to regulate their use, although it would be of small value and little importance now, in a few years it would be of immense value and of the greatest importance to the farming community.

It would give to the men who controlled the water or owned the canals the power, should they choose to exercise it, of controlling every farmer who depended on irrigation for his crops or upon a water ditch for his stock.

It would soon have a relation to public affairs that no power but revolution could conquer or control. It would imperil the great future already marked out for us, and set us back on the scale of advancement a quarter of a century.

THE PROFITS OF IRRIGATION.

There are three classes of profits in irrigation that should be considered:

First—The profit arising from the direct sale and use of water for irrigation and transportation.

Second—The benefit arising from increased value of land.

Third—Increased production.

Under the first proposition, we can only be guided by the experience of such investments in other countries.

In the Tonjore Delta, in India, after deducting the expenses of repairs to the canals and five per cent for use of capital, the investment pays twenty-two and one half per cent per annum.

So, also, in the Godavery Delta, the profit is enormous, the annual profits to the Government from all sources amounting to fifty per cent. This seems exaggerated, so much so that I feel constrained to say that my authority, the thirty-third volume Institutes of Civil Engineering, eighteen hundred and seventy-two, published in London, is unquestioned. It further appears that the profits of the cultivation of the soil on irri-

gated lands, over dry cultivation, is from one hundred to four hundred per cent, and that in India the second crop pays the farmer forty-six per cent profit.

In all the country irrigated in India, the revenue derived by the Government from taxation is six hundred and fifteen dollars per square mile; while in the unirrigated district, equally well located in other respects, it is three hundred and eighty-five dollars per square mile. The population is nearly one half greater in irrigated than in unirrigated districts.

The Eastern Jumna Canal has paid the Government, directly and indirectly, twenty-four per cent per annum on the investment.

In Italy the profits have not been so large; in truth, many of the canals there have only paid small interest. This is attributable to many causes; chief among them are the roughness of the country, and hence the vast expense for leveling the land and constructing canals, the natural moisture of the climate, imperfect and expensive transportation of produce, and an old-time unprogressive system of cultivation, which is slow, laborious, and expensive. Few or none of the labor-saving machines so common in England and America are used by the Italians.

Says a leading author on Italian irrigation: "The small canals of Italy have never paid a handsome interest. It is to the indirect returns, such as the improvement of the soil, the replacing of inferior by superior kinds of cultivation, that the proprietors look in the first instance for their reward;" and this, even in Italy, has been immense.

The second generation, and not the constructors of these canals, has reaped the benefit. In few instances has an irrigating canal paid for the first few years after its construction.

The financial history of some of them has been a continuous struggle, while a majority, and those the large canals, have, after a few years, been an unvarying success, much depending upon the character of their superintendence.

FLUCTUATIONS OF ANNUAL PRODUCTIONS.

There is very little difference in the annual production of irrigated districts, while on dry, unirrigated lands, as shown by years of experiment, it amounts to about fifty-two per cent—that is, in some years the production will be fifty-two per cent less than in others; while in irrigated districts it only varies from three to four per cent per annum. This has nothing to do with values; I refer only to the amount of production. The statistics to prepare this estimate were obtained through a term of years, especially for the British Government, and the result may be taken as correct. They show that with irrigation there can never be a failure of crops, while in dry culture the chances are that every other crop will not pay a profit.

This does not apply to fruit raising, but especially to the production of the cereals. Of itself it is a sufficient argument to sustain irrigation in a climate like California, if argument be needed.

THE NUMBER OF CROPS PLANTED ANNUALLY.

In very few of the irrigated districts do the farmers plant less than two crops a year, and in many places in Northern Italy, three, four, and five. Indeed, seven crops of Marcite grass are cut for hay in what is known as the Winter meadow lands of Italy, and what to us seems

the most marvelous, twenty-five tons of this Marcite grass hay are cut from a single acre of land in one year. And near Milan, according to Captain Baird Smith, forty-five to fifty tons are sometimes taken from an acre in a single year, and from thirty-five acres of land, fifty dairy cows are kept the year round. This statement is also indorsed by M. Breaschi, who is a recognized authority on Italian irrigation. Of course, this land is highly manured and well cultivated.

Such lands are usually watered one day in seven. The surface is made of a uniform slope or a perfect level.

In India, two crops are planted in the year. Cotton, sugar-cane, and indigo in Summer, and wheat, barley, and vegetables in Winter.

On the Nile in Egypt, two and three crops a year are raised. In Utah, at Great Salt Lake, where all grain is irrigated, but one crop is produced. This is due to the rigor of their Winter climate. In this State, two crops can be raised in any of the valleys, if the land is well cultivated; one of wheat or barley, and one of corn, potatoes, vegetables, hay, or cotton.

COST OF LEVELING LANDS FOR IRRIGATION.

In many parts of Italy it costs as high as two hundred dollars to three hundred dollars an acre to prepare the land for irrigation, although generally not so much. In one instance, in Piedmont, it cost, in our money, to prepare six hundred and forty acres of land for irrigation, two hundred thousand dollars.

It will be found, when irrigation becomes one of the leading pursuits of our State, that lands we had supposed required but little leveling will demand a vast deal of labor to bring them to a perfect plane, and this must be taken into account of cost of irrigation.

As a rule, however, California is better situated in this respect than any other country.

Our valleys are not rolling land, but vast plains, with regular and graduated slopes, that tip toward the principal watercourses so gently that they seem a perfect level. They appear as if they had been made plastic, then rolled off for these uses. Indeed, the greater portion of the San Joaquin Valley, and part of the Sacramento Valley, will require little or no leveling.

THE MAGNITUDE OF SOME OF THE IRRIGATING CANALS.

The eastern Jumna Canal, in India, for thirty or forty miles, runs between embankments of the most massive proportions, and is elevated above the surrounding country from six to twelve feet.

This canal, as far back as eighteen hundred and fifty, had over five hundred miles of side channel, and irrigated one hundred and sixty thousand acres of land. Since then its capacity has been largely increased.

The great Ganges Canal, as before stated, is one hundred and seventy feet wide, and ten feet deep. In eighteen hundred and sixty-nine, it irrigated one million seventy-eight thousand acres, while two years before, the same canal only irrigated five hundred and forty-four thousand acres; showing the most satisfactory increase. At this time it will irrigate one and a half millions acres of land.

The Soane Canal of India, recently constructed, is one hundred and eighty feet wide at the base, and has an average depth of nine feet of

water, with a fall of six inches to the mile, and is capable of irrigating one million two hundred thousand acres. This canal alone will carry more water than runs in the lower San Joaquin River in most of the season. It irrigates what in Europe would be an empire. It will secure at least two good crops a year on all that vast extent of territory. It makes what were barren parched plains, more forbidding than the most desolate spot in the San Joaquin Valley, gardens clothed in perpetual verdure; a land where seed time and harvest follow without intermission; where the Summer produces sugar cane, cotton, rice, and indigo, and the Winter wheat, barley, and Indian corn.

The great canal of the Ticino irrigates the magnificent plains of Lombardy. It was constructed in the twelfth century, and for six hundred and fifty years has borne down its great course over one thousand eight hundred cubic feet of water per second.

"This great mass of water has been spread over the surface of the country through a thousand channels, stimulating the productiveness of the soil to such an extent as to make the country through which it passes one of the richest and most densely populated in the world. When the amount of social and national benefit through long periods of varied fortune is recalled to mind, one feels a sympathy in the pride with which it is regarded by the descendants of its original constructors."

Its massive stone aqueducts, solid masonry locks, granite enbankments, waste ways made entirely of stone, its bed in places paved with rock, make it a marvel of solidity. For six and a half centuries this has been the great artery to the agricultural life of Lombardy, and to-day is one of the chief sources of the prosperity of her people.

AMOUNT OF WATER NECESSARY TO BE USED FOR IRRIGATION.

For ordinary crops the amount of water necessary for irrigation is from four to six inches for one crop, although twice and three times that quantity is sometimes used.

This means that amount is distributed through the season over the surface of the land, much depending on the character of the soil, kind of crop, and cultivation. In most parts of Italy the quantity of water is double that, though with some crops and in some seasons not half of it is required.

In this State, for crops of wheat and barley sown, say in October or November, or even in December, one or two irrigations in the Spring would be ample, and would secure an enormous yield.

For the second crop, whether of corn, potatoes, vegetables, cotton, or pasture, more water in this climate would be required.

PRICE OF WATER.

In India the price of water for rice culture is about three dollars per acre; both there and in Italy the price varying in different districts and for different grains. For some grains the price is as low as fifty cents per acre, while for other districts and for other crops, it is as high as seven dollars per acre per annum. This is for the year, and always includes two crops. From one dollar to three dollars per annum seems to be the average price paid in these countries.

IRRIGATION IN CALIFORNIA.

It is an admitted fact, proven by the experience of twenty-four years, that the average annual rainfall in California will not, more than one year in two, mature a crop on one half of the arable land of the State. During the ten years from eighteen hundred and sixty-two to eighteen hundred and seventy-two, the annual rainfall in San Joaquin Valley and in Los Angeles averaged less than ten inches.

In some years, in these localities, only from three to five inches fell, and in no event can the rainfall be depended upon except for the months of December, January, February, and March.

The remaining eight months of the year, though not all rainless, cannot be safely relied upon.

Indeed, it is estimated that there are at least ten million acres of valley land in this State that cannot be successfully cultivated without irrigation. Most of these lands are now assessed at from one to five dollars per acre, while with irrigation the lowest probable assessed value would be fifty dollars per acre. In such a country, and with such a climate as California, water in canals for the purpose of irrigation and cheap transportation would seem a manifest necessity; but the pertinent inquiry presents itself—

HAVE WE THE WATER SUPPLY?

If we are destitute or short of this needed supply, all our hopes fall to the ground.

The Tulare Lake, in the southern portion of the San Joaquin Valley, covers an area of nearly seven hundred square miles, or about four hundred and fifty thousand acres, and is one hundred square miles larger than the bays of San Francisco and San Pablo. It has an elevation of two hundred feet above sea level; is two hundred miles from tide water, with not a hill or rough piece of ground on the west side of the San Joaquin Valley, from it to the Suisun Bay. The irrigatable land of that valley, on the west side of the river, which water from this source will reach, is about four hundred thousand acres, not an acre of which can be depended upon for a crop.

Kings River, the San Joaquin, Kern River, the Sacramento, Clear Lake, Silver Lake, the Blue Lakes, and Lake Tahoe, make the supply of water for irrigation purposes more than ample for all future time.

With canals of the dimensions needed, the produce of the two great California valleys can be floated down to tide water at an expense of not exceeding two dollars per ton; and if water is sold at one dollar and fifty cents to one dollar and seventy-five cents per acre per annum, the profit will be handsome to the companies, while to the farmer it will be a perpetual guarantee of good crops.

Nothing within the range of human ingenuity will go so far toward relieving this State of the great land monopolies. Cotton fields will be seen everywhere in the great stretch of country reaching the whole length of the Sacramento and San Joaquin Valleys. Indeed, every variety of production, which our soil and climate are capable of, will be raised there.

Under irrigation one hundred and sixty acres of land will be an independence to any man. Happy the home of the farmer, when the measureless pasture lands of California are cut up into small farms, and by irrigation rendered capable for man's use.

EXTENT OF COUNTRY IRRIGATED IN CALIFORNIA.

There is already a large extent of country irrigated here. Indeed, there is hardly a vegetable garden, or an ornamental yard in either city or country, that is not irrigated.

All the strawberry vines, raspberries, blackberries, and many of the currants, are irrigated.

Some of the largest vineyards, like the Cocomungo and Natoma, are also irrigated. All the orange and lemon orchards, and, in fact, all semi-tropical fruits, require irrigation in this climate. Grain is irrigated in some portions of the State, but to a very limited extent.

Irrigation here is accomplished in three ways:

First—By ordinary wells, the water being raised by windmills, horse or steam-power.

Second—By artesian wells, where the water flows out of the top of the pipe.

Third—By ditches, flumes, and pipes, which connect with water-courses.

No person, who has not given this subject thoughtful inquiry, is aware of the value and extent of irrigation even now.

What it will be a quarter of a century from now can hardly be approximated. Our large irrigating canals are as yet incomplete and few in number. They are merely the beginning; but this beginning must mark a new era in the productive capacity of the State.

The San Joaquin Canal and Irrigating Company has built forty miles of canal, having a mean width of fifty feet, and a depth of five and a half feet of water, which is capable of irrigating about one hundred thousand acres of land. Nine tenths of the land through which this canal now passes is owned by one firm, who pay one dollar and twenty-five cents per acre per annum for irrigation. This is a lower rate than is paid either in Italy, Spain, or India, for the use of a like amount of water. The Kings River Irrigating Canal is six miles long, thirty feet wide, and four feet deep, and has a fall of a foot to the mile. This, when extended, will irrigate from sixty thousand to seventy-five thousand acres of land, if there is water to run the canal full with that fall.

The Fresno Canal is now ten miles long, forty feet wide, and three feet deep, with a grade of eight tenths of a foot to the mile.

The canal owned by Chapman, Lux & Miller is thirty miles long, from thirty to thirty-five feet wide, and two and a half to three feet deep, with a grade of one foot to the mile, and will irrigate from forty thousand to fifty thousand acres.

In computing the extent of country a certain canal will irrigate, many questions are presented which will render all estimates uncertain, as:

First—Whether the canal is run full of water.

Second—Its grade.

Third—The character of the irrigation required, some grains requiring twice the irrigation that others do, and some soils more water to thoroughly saturate them than others.

Fourth—Whether two crops are to be raised upon the same land in the same year.

Fifth—The amount of absorption and evaporation.

My estimates of the capacities of the canals just referred to are below that of the proprietors, but I am persuaded I am near the true figure, for my estimates are founded upon a long line of statistics furnished by

other countries, where irrigation has commanded and received careful consideration from the most distinguished engineers.

It may also be remarked, that thorough irrigation will require more water here than in any of the large irrigating countries, except Egypt, for the rainfall is much greater there than with us.

In the irrigated portions of Italy the average annual rainfall is about thirty-eight inches, in India over thirty, and in some localities above forty; while our average annual rainfall is less than twenty-three inches, and in the San Joaquin Valley it will not exceed ten.

SIZE OF FARMS.

No fact is more clearly demonstrated than that small farms and good tillage are better for a country than large farms and inferior tillage; nor is any truth better established than that any cultivation is an improvement over pasturage.

To succeed in irrigation, much personal attention is necessary. This personal attention will be given by proprietors of the soil only. Where land is cheap and money plenty, as in California, all may be proprietors.

No man who has intelligence enough to farm well will rent land when he can work his own; therefore, little fear need be entertained that the ownership of the irrigating canals will carry with it the ownership of the land. This may occur in isolated instances, but it can never in California rise to the importance of a danger. He who is a large land owner this year, will be poor next year. Fortunes come and go with the seasons. One generation acquires wealth by toil and frugality. The next generation of the same family scatters it. The large grants of land in California have retarded our prosperity, chiefly because these grants have been used for grazing purposes, and have not been taxed up to the proportionate value of small farms. Once irrigate the country, and the lands in large tracts under one ownership will, as a rule, be confined to remote or mountainous districts, while gardens and orchards will be found on every one hundred acres of land in all the valleys of the State, population will increase, wealth will be more evenly distributed, villages will appear every few miles, a thousand pleasant homes will dot the State where now there are but scores. Clumps of trees, orchards, and vineyards will give variety and beauty to every landscape, and peace, comfort, and security to the millions of tillers and occupants of the soil.

We have just started on the second quarter of a century of our history, at the end of which I might in fancy measure our progress: our population quadrupled, our valleys the gardens as they are now the granaries of the world, our commerce teeming with wealth, and noisy with labor.

I might mark out through the great plains of the State, long lines of canals, whose banks are clothed in verdure and lined with trees, with broad roadways upon either side, and a thousand channels, or arms, reaching out into the land like arteries through the human system. I might fancy our low hills and rolling lands covered with vines, which would then alone furnish an annual income of forty millions of dollars.

I might wander through our orange and lemon groves that would everywhere adorn our valleys, and perfume the air with the rich aroma of their flowers. I might visit our institutions of learning, and find

colossal structures erected for educational purposes, richly supplied with libraries and apparatus, and crowded with students. I might follow along the track of railways reaching on the north from tide water at San Francisco to Washington Territory; on the south, to Texas and the lower Mississippi. I might fancy ocean steamers, built upon plans now unknown, and making time now unthought of, running semi-weekly to China, Japan, Australia, the South American, and Mexican ports. This much and more I might fancy.

I do not say this will happen within the next quarter of a century, for no one can fathom the depth of the future; but it will argue but little for California enterprise, if we allow such slow plodding people as the Italians, the Egyptians, and the English to outstrip us on the great march of human progress.

Believe me, much of this will be accomplished within the lifetime of many who are now present. Here shall be the seat of Empire. By the ordinance of God and the harmony of nature man can go westward no further. Everything that enterprise can inspire or genius invent, will center here. Art and science, and poetry and eloquence, sisters of thought and offspring of genius, will cluster together in this favored land.

Men distinguished in every country, and whose names belong to mankind, will come here to be schooled in the marvels of the new West, as they once went to Athens and to Rome.

Here will be the seat of learning. The grandeur of the scenery will attract to these shores the finest painters of all countries. The old masters, so long the study of students in the East, will lose their chief attractions in the presence of such sublime models as the Yosemite, the Sierra Nevada, and the mountain-walled valleys of the Coast Range.

While these varied attractions lend enchantments to all other pursuits, must agriculture, in the presence of such a climate, beneath such a sky, with such a soil, follow or lead in the grand march to the empire of success?

Ceres shall be the Queen of California; clothed in garments of labor, hardy with toil, she shall wear the crown. This shall be her empire; here her throne with no divided sovereignty nor rebellious subjects. She shall be the chief among her sisters, for her throne is peace—her victory plenty.

TABLE OF STATISTICS,

FOR THE YEAR 1873,

AS REPORTED TO THE

SURVEYOR GENERAL,

BY THE SEVERAL COUNTY ASSESSORS.

STATE OF CALIFORNIA, OFFICE OF SURVEYOR GENERAL,
SACRAMENTO, February 19th, 1875.

ROBERT BECK, ESQ., *Secretary of the State Agricultural Society:*

DEAR SIR: Herewith I transmit a copy of the statistics, compiled from the reports of the County Assessors, received at this office for the year eighteen hundred and seventy-four.

Very respectfully,

ROBERT GARDNER,
Surveyor General.

TABLE OF STATISTICS.

Industrial and other statistical information for the year 1873, as reported to the Surveyor General by the several County Assessors, embracing the entire State.

COUNTIES.	Acres of land inclosed.....	Acres of land cultivated	WHEAT.		BARLEY.		Acres of land cultivated in 1874..	Acres of wheat sown in 1874...	Acres of barley sown in 1874...
			Acres	Bushels ...	Acres	Bushels ...			
Alameda	125,972	116,911	63,139	1,450,353	30,273	875,612	.....	73,042	24,505
Alpine	4,500	2,862	200	4,000	360	900	.....	.....	.....
Amador	60,184	18,713	845	21,125	1,520	45,360	.....	650	2,370
Butte	311,350	184,375	148,935	2,780,700	21,325	475,936	.....	150,543	20,700
Calaveras	48,565	11,160	800	2,938	2,200	23,167	.....	2,999	4,938
Colusa	300,000	300,000	200,000	2,000,000	10,000	200,000	.....	275,000	10,000
Contra Costa	174,600	83,800	61,650	1,720,400	16,200	660,200	.....	.....	.....
Del Norte	11,375	2,576	293	8,250	190	8,300	.....	268	290
El Dorado	60,080	13,706	806	6,230	320	2,297	.....	672	240
Fresno	146,000	47,000	30,000	180,550	15,600	234,000	.....	37,980	18,774
Humboldt	70,600	16,540	1,645	40,000	790	21,000	.....	1,740	800
Inyo	9,230	9,194	1,668	31,666	1,149	25,120	.....	1,063	970
Kern	38,283	15,025	4,848	119,200	5,171	125,464	.....	6,000	8,000
Klamath	1,222	701	54	605	10	200	.....	59	15
Lake	41,487	10,419	4,518	82,320	2,093	44,121	.....	4,660	2,492
Lassen	25,147	5,312	1,948	30,824	2,362	48,185	.....	2,015	2,125
Los Angeles	46,000	53,000	650	13,600	12,900	376,000	.....	700	13,400
Marin	293,104	15,697	2,103	44,163	879	27,688	.....	.....	.....
Mariposa	28,200	8,400	730	1,725	3,.00	Cut for hay.	.....	1,000	2,700

Mendocino	81,680	20,907	4,325	86,573	2,511	77,842		6,260	3,375
Merced	251,516	201,495	165,140	865,530	24,602	310,752			
Modoc	24,500	18,200	7,000	140,800	5,200	210,860		8,165	4,800
Mono	11,340	720	230	4,600	190	3,800		200	280
Monterey	263,589	121,240	91,450	2,424,800	29,600	962,500		98,500	16,950
Napa	110,455	44,015	32,985	495,900	3,985	117,210		31,110	4,780
Nevada	68,000	15,500							
Placer	21,673	45,033	19,072	199,224	5,704	70,805		22,649	7,012
Plumas	48,583	3,578	781	10,483	492	5,594			
Sacramento	292,505	60,610	8,144	171,844	19,971	350,797		11,970	13,412
San Benito	160,000	60,000	40,000	480,000	15,000	200,000		50,000	20,000
San Bernardino	22,000	10,000	3,000	31,000	4,200	93,925		3,000	5,000
San Diego	17,222	20,714	6,506	103,120	9,520	45,560		10,000	8,500
San Francisco									
San Joaquin	275,000	246,250	190,000	2,225,000	33,000	560,000		220,000	40,000
San Luis Obispo	150,000	40,000	5,000	100,000	30,000	750,000		5,000	30,000
San Mateo	85,160	33,115	7,240	127,215	4,180	120,261		8,535	4,350
Santa Barbara	26,773	28,390	15,715	168,229	8,474	286,365		17,650	9,050
Santa Clara	513,361	208,432	175,233	1,632,762	13,101	127,239		169,283	15,737
Santa Cruz	70,556	19,971	7,890	201,150	4,420	168,800		8,100	5,300
Shasta	60,000	31,350	8,280	115,920	7,645	150,945		7,560	8,825
Sierra	27,600	2,995	1,700	28,360	700	15,219		1,700	700
Siskiyou	67,780	30,127	10,937	174,992	1,670	43,400		10,937	1,670
Solano	221,209	149,331	125,437	2,072,118	10,964	276,461		320,216	12,000
Sonoma	661,343	68,265	27,804	526,450	6,377	144,795		26,305	9,718
Stanislaus	45,600	450,000	405,000	3,000,000	45,000	900,000		450,000	45,000
Sutter	264,450	153,652	100,780	1,209,260	20,132	501,352		65,643	16,231
Tehama	159,000	50,000	40,000	1,000,000	14,000	350,000		25,000	1,000
Trinity	12,150	9,563	980	14,300	50	670		1,156	43
Tulare	75,397	43,782	15,412	206,856	23,797	252,143		19,265	29,746
Tuolumne	155,000	35,000	4,600	70,000	900	9,000		6,875	1,500
Ventura	4,000	18,000	1,078	19,381	14,922	298,440		1,904	38,177
Yolo	81,593	160,450	65,335	2,080,000	11,315	282,875			
Yuba	137,700	50,640	16,729	260,055	8,153	182,464		12,988	7,700
Totals	6,262,634	3,366,716	2,128,615	28,784,571	496,217	11,063,564		2,178,362	473,175

TABLE OF STATISTICS—Continued.

COUNTIES.	OATS.		RYE.		CORN.		BUCKWHEAT.		PEAS.	
	Acres.....	Bushels....	Acres.....	Bushels....	Acres.....	Bushels....	Acres.....	Bushels....	Acres.....	Bushels....
Alameda	1,489	32,450	45	1,000	1,450	39,600			51	1,022
Alpine	40	120								
Amador					687	28,654				
Butte	50	1,810	134	2,330	174	6,300				
Calaveras					240	6,000				
Colusa	9,000	180,000	100	2,000	500	4,000			10	300
Contra Costa	4,500	162,250	80	1,820	190	9,150			10	220
Del Norte	684	30,148			45	1,575			43	825
El Dorado	184	716								
Fresno	750	12,730	100	2,400	300	8,500			7	1,850
Humboldt	4,796	253,000			240	9,600	10	200	2,040	64,520
Inyo	697	21,250			2,404	59,846			10	100
Kern	275	9,045	80	2,040	2,000	50,000			10	300
Klamath	164	3,230	7	60	20	400			10	400
Lake	110	4,500			323	7,565				
Lassen	1,495	40,856			4	185	2	35	2	76
Los Angeles	400	2,000	200	5,000	12,400	565,000	65	1,475	95	2,420
Marin	9,113	223,258								
Mariposa	400	cut for hay	150	cut for hay	20	200				
Mendocino	1,273	33,560			520	9,284				
Merced	10	200	195	1,220	1,000	21,780				
Modoc	40,000	150,600	40	1,080	5	160			24	290
Mono	280	7,000								
Monterey	550	22,000	90	2,700	900	27,000	90	2,700	95	2,850
Napa	1,095	36,135	15	235	2,135	65,320			3	65
Nevada										
Placer	5,949	cut for hay	396	4,490	56	1,517				
Plumas	1,895	44,135			100	2,000				

Sacramento	2,064	44,676	3	50	1,691	52,300				
San Benito	200	6,000			100	2,000				
San Bernardino	40	1,600			900	16,000				
San Diego	300	6,000			359	10,770			24	680
San Francisco										
San Joaquin	1,040	29,000	650	8,000	250	7,260			6	200
San Luis Obispo					300	7,500			20	400
San Mateo	8,505	352,700			39	1,200			20	85
Santa Barbara	6	280			1,094	43,496			5	125
Santa Clara	837	13,136	127	2,172	117	5,307			5	97
Santa Cruz	2,225	73,025	97	2,231	1,243	22,317	23	640		
Shasta	175	4,375	50	1,015	130	2,725				
Sierra	500	12,500	10	200						
Siskiyou	2,900	72,500	35	450	95	2,941	30	132	20	250
Solano	136	15,000	17	581	27	3,750				
Sonoma	4,908	141,605	243	6,540	3,590	108,290	1	15		
Stanislaus					200	7,500				
Sutter	175	2,333			573	13,342	10	400		
Tehama	100	1,000			150	3,000				
Trinity					45	315				
Tulare	937	22,488	175	3,150	700	14,000				
Tuolumne	150	1,400	75	1,300	80	2,000			15	400
Ventura	17	180	7	80	1,200	24,000			67	
Yolo	100	3,000			60	1,800			30	600
Yuba	215	4,013			938	32,230				
Totals	74,729	2,077,804	3,121	52,144	39,594	1,307,679	231	5,597	2,622	78,075

TABLE OF STATISTICS—Continued.

COUNTIES.	PEANUTS.		BEANS.		CASTOR BEANS.		POTATOES.		SWEET POTATOES.	
	Acres.....	Pounds.....	Acres.....	Bushels.....	Acres.....	Pounds.....	Acres.....	Tons.....	Acres.....	Tons.....
Alameda			321	8,502			1,474	2,461		
Alpine			6				40	120		
Amador							123	460	4	13
Butte	20	100,000	7	152			16	27	16	32
Calaveras			8	2,810			250	620		
Colusa			15	450			50	90	20	50
Contra Costa			180	5,620			200	1,020	4	25
Del Norte			9	210			134	452		
El Dorado							84	5,490		
Fresno			10	170			29	160	9	16
Humboldt			2	30			3,056	18,336		
Inyo			18	531			84	257		
Kern	10	15,000	67	1,640			176	323	124	242
Klamath			5	50			24	95		
Lake							25	57		
Lassen			3	46			48	127		
Los Angeles	90	81,000	1,080	21,700	104	104,000	1,700	8,080	165	950
Marin							959	1,438		
Mariposa			20	150			75	350		
Mendocino							730	2,024		
Merced			107	1,377			34	97	20	161
Modoc			18	780			400	1,150		
Mono							20	20		
Monterey			975	27,300			1,750	4,375		
Napa			7	130			35	105		
Nevada							250	3,000		
Placer	15	3,954					377	174	28	16½
Plumas							95	210		

Sacramento	10	8,000	605	26,160			1,344	6,490	393	1,873
San Benito							65	195		
San Bernardino			10	400			75	186	15	33
San Diego			47	1,410			418	1,470		
San Francisco										
San Joaquin			70	2,500			150	500		
San Luis Obispo			400	16,000			100	400		
San Mateo			75	1,420			4,010	93,210		
Santa Barbara			476	11,360			133	332	2	5
Santa Clara							194	3,703	7	42
Santa Cruz			233	2,766			570	1,940		
Shasta			60	1,500			196	570	3	8
Sierra							95	275		
Siskiyou			40	600			300	274		
Solano							1	3	1½	7
Sonoma					2	1,000	3,135	13,419	23	34
Stanislaus										
Sutter			125	3,375			213	396	312	967
Tehama	200	50,000	10	300			100	400	20	100
Trinity			8	400			125	360		
Tulare			75	1,500			520	208	20	84
Tuolumne			400	8,000			450	4,800		
Ventura			682				99		2	
Yolo	30	30,000	300	12,000	20	30,000	80	2,400	50	1,500
Yuba			30	940	10	10,600	93	360	13	78
Totals	375	287,954	6,504	162,379	136	145,600	24,704	183,009	1,466½	6,236½

TABLE OF STATISTICS—Continued.

COUNTIES.	ONIONS.		HAY.		FLAX.		HOPS.		TOBACCO.		SUGAR BEETS.
	Acres.....	Bushels.....	Acres.....	Tons.....	Acres.....	Pounds.....	Acres.....	Pounds.....	Acres.....	Pounds.....	Tons.....
Alameda	203	16,000	18,225	32,741	14	10,080	22	10,000	.....	.....	2,500
Alpine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Amador	.....	.....	4,175	5,085	.....	.....	23	21,240	.....	.....	.....
Butte	1	40	12,985	12,115	.....	.....	.....	.....	.....	.....	.....
Calaveras	80	3,100	5,877	3,200	.....	.....	.....	.....	.....	.....	.....
Colusa	6	160	4,000	7,000	.....	.....	.....	.....	2	250	.....
Contra Costa	19	3,200	20,050	31,020	.....	.....	.....	.....	.....	.....	2,980
Del Norte	.....	.....	864	1,774	.....	.....	.....	.....	.....	.....	40
El Dorado	.....	.....	7,285	5,096	.....	.....	.....	.....	.....	.....	.....
Fresno	7	155	4,600	4,780	.....	.....	.....	.....	.....	.....	.....
Humboldt	3	200	3,540	8,850	.....	.....	.....	.....	.....	.....	300
Inyo	20	300	3,210	3,711	.....	.....	.....	.....	.....	.....	.....
Kern	70	1,800	5,632	7,996	.....	.....	.....	.....	.....	.....	.....
Klamath	4	80	53	160	.....	.....	.....	.....	.....	.....	.....
Lake	.....	.....	4,957	6,294	.....	.....	20	5,000	.....	.....	.....
Lassen	2	186	6,548	9,856	.....	.....	.....	.....	.....	.....	16
Los Angeles	90	25,200	3,000	7,500	15	.....	12	20,000	20	16,000	.....
Marin	.....	.....	2,642	3,633	.....	.....	.....	.....	.....	.....	.....
Mariposa	8	350	6,000	5,000	.....	.....	.....	.....	.....	.....	.....
Mendocino	.....	.....	8,090	10,952	.....	.....	140	110,900	.....	.....	.....
Merced	4	430	9,008	6,805	.....	.....	29	14,200	.....	.....	.....
Modoc	15	200	5,000	8,600	.....	.....	.....	.....	.....	.....	.....
Mono	.....	.....	4,362	4,555	.....	.....	.....	.....	.....	.....	.....
Monterey	3	150	8,000	16,000	1,500	For seed.	25	.....	.....	.....	.....
Napa	5	370	10,115	12,100	.....	.....	45	76,500	.....	.....	90
Nevada	.....	.....	3,400	3,000	.....	.....	.....	.....	.....	.....	.....
Placer	.....	.....	4,353	4,490	.....	.....	.....	.....	.....	.....	.....
Plumas	.....	.....	18,098	10,708	.....	.....	.....	.....	.....	.....	.....

Sacramento	45	6,855	24,423	22,373			189	243,500			2,500
San Benito			4,000	6,000	150	180,000			40	240,000	
San Bernardino	6	1,620	1,000	2,200							20
San Diego			1,840	3,680							
San Francisco											
San Joaquin	17	2,500	21,000	19,000			10	9,300			
San Luis Obispo	8	600	50,000	75,000							600
San Mateo	20	945	4,020	6,508	175	172,000	14	2,700			
Santa Barbara			1,017	8,108							
Santa Clara	49	5,726	27,212	49,837			220	316,320	540	810,000	
Santa Cruz			2,500	3,120	710	1,043,000	60	21,000			
Shasta	4	245	11,620	8,715							
Sierra			8,454	9,729							
Siskiyou	8	750	7,075	10,050							15
Solano											30
Sonoma			16,444	19,666			23	11,000			235
Stanislaus			2,000	1,501							
Sutter	15	1,350	30,470	24,000			15	8,000			
Tehama	5	250	5,000	10,000							
Trinity	5	490	2,100	2,400							
Tulare			7,600	6,675							
Tuolumne	150	3,000	18,000	20,000					23	4,780	
Ventura			231								
Yolo	40	4,800	8,000	12,000							750
Yuba			16,443	12,560							
Totals	912	81,052	454,518	566,144	2,564	1,405,080	847	899,660	625	1,071,030	10,076

TABLE OF STATISTICS—Continued.

COUNTIES.	COTTON.		Pounds of butter..	Pounds of cheese..	Pounds of wool....	Number of hives of bees.....	Pounds of honey...
	Acres.....	Pounds.....					
Alameda			88,250		624,256	250	2,560
Alpine							
Amador			10,500		105,420	65	860
Butte			21,000	10,800	353,072	691	3,960
Calaveras			29,400	600	225,850	407	2,000
Colusa			10,000		1,000,000	1,000	5,000
Contra Costa			150,024	40,890	38,975	92	2,520
Del Norte			69,550		2,050	123	1,235
El Dorado			125,770	8,000	29,730		
Fresno	130	78,745	9,650	3,400	1,970,485	160	3,500
Humboldt			90,000	4,500	219,000	260	3,000
Inyo			4,500		890	180	1,608
Kern			23,450	7,285	1,000,000	96	2,500
Klamath			2,000		1,000	37	1,000
Lake			14,500	18,000	89,575	453	1,710
Lassen			52,174	9,112	60,835	8	400
Los Angeles			35,000	8,500	2,000,000	4,500	270,000
Marin			2,336,220	31,216	4,265		
Mariposa			7,000		100,000	5	
Mendocino			64,000	3,800	656,508	478	2,000
Merced	461	122,000	58,530	102,000	1,653,275	339	1,550
Modoc			16,000	3,800	66,400		
Mono			550		2,500	20	
Monterey			21,000	16,000		420	
Napa			127,500	13,200	103,100	240	4,970
Nevada							
Placer			18,405	1,000	103,725	333	2,163
Plumas			205,700	4,000	27,141	116	1,740

Sacramento	2	4,000	231,445	81,800	331,935	702	4,700
San Benito			22,900	31,000	359,745	36	300
San Bernardino			23,000	4,000	80,000	1,589	75,000
San Diego			16,775	1,680	516,156	2,458	46,164
San Francisco							
San Joaquin			175,000	9,000	352,252	1,656	4,500
San Luis Obispo			300,000	500,000	1,281,115	425	6,000
San Mateo			372,150	44,000			200
Santa Barbara			4,500	25,000	1,725,944		
Santa Clara			87,423	506,169	102,475	156	1,739
Santa Cruz			112,470	27,360			
Shasta			9,280		19,996	331	2,648
Sierra			90,100	1,100	3,874	145	3,700
Siskiyou			62,270	17,926		958	7,230
Solano			69,620		24,620	480	27,000
Sonoma			280,101	103,290	62,305	61	
Stanislaus			7,500		676,400	428	12,840
Sutter			63,184		92,644	1,532	932
Tehama			20,000	3,000	2,000,000	100	3,000
Trinity			20,000	200		66	450
Tulare			12,000		1,210,000	849	9,000
Tuolumne			100,000	80,000	11,000	242	5,000
Ventura			800	700	7,500		
Yolo			120,000		160,000	150	5,000
Yuba			30,000		78,000		
Totals	593	204,745	5,822,091	1,722,328	19,533,813	22,537	529,679

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of apple trees	Number of peach trees	Number of pear trees	Number of plum trees	Number of cherry trees	Number of nectarine trees	Number of quince trees	Number of apricot trees	Number of fig trees	Number of lemon trees	Number of orange trees	Number of olive trees
Alameda	62,720	13,423	23,150	26,591	38,087	2,756	1,685	2,511	1,180	94	550	679
Alpine	100	60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Amador	35,140	18,685	10,630	3,160	1,190	830	955	2,240	1,040	42	164	17
Butte	34,761	35,186	6,328	5,448	3,452	738	496	3,537	2,236	320	390	132
Calaveras	27,300	11,500	3,840	2,316	534	403	760	560	1,684	8	81	6
Colusa	50,650	75,000	14,500	10,560	6,300	3,640	2,200	3,285	4,500	45	20	.....
Contra Costa	37,180	14,500	8,400	5,020	3,400	500	1,520	1,110	860	30	84	90
Del Norte	8,498	277	375	512	239	10	16	12	2	.....	3	.....
El Dorado	72,513	13,800	14,168	11,998	1,619	629	478	304	379	.....	.....	.....
Fresno	3,840	6,794	568	400	223	86	108	275	612	72	380	26
Humboldt	60,850	2,000	1,690	2,540	1,540	.....	130	150	25	.....	.....	.....
Inyo	1,564	3,922	283	376	166	65	178	113	14	.....	.....	.....
Kern	3,269	5,321	807	1,109	637	362	408	806	820	125	137	48
Klamath	2,602	117	87	195	60	19	13	17	.....	.....	.....	.....
Lake	11,223	4,758	2,079	1,953	250	125	55	156	64	.....	.....	.....
Lassen	8,295	3,240	612	478	128	38	106	224	.....	.....	.....	.....
Los Angeles	7,800	13,700	5,000	250	150	500	1,100	2,200	2,500	5,300	34,700	2,000
Marin	31,610	289	893	815	276	24	197	33	67	.....	.....	.....
Mariposa	6,000	5,500	900	450	175	200	80	400	450	.....	.....	.....
Mendocino	13,511	5,409	900	1,704	460	400	103	205	74	.....	.....	.....
Merced	7,482	7,784	2,021	2,312	518	231	276	1,012	1,018	39	87	120
Modoc	670	10	36	20	48	4	6	10	.....	.....	.....	.....
Mono	50	6	6	6	6	.....	.....	.....	.....	.....	.....	.....
Monterey	2,640	1,650	1,140	750	200	25	40	180	50	.....	10	.....
Napa	62,940	24,175	21,325	8,120	14,260	8,780	1,670	2,030	1,020	55	90	660
Nevada	57,850	22,150	9,069	5,664	5,163	871	1,372	330	942	.....	.....	.....
Placer	60,249	26,828	13,435	6,600	7,405	1,220	1,598	909	2,436	33	84	74
Plumas	3,554	3,289	385	257	253	44	25	11	10	.....	.....	.....

Sacramento	97,413	108,350	33,809	27,469	6,986	3,210	3,458	12,401	5,241	770	842	141
San Benito	16,476	11,840	1,600	1,125	876	700	760	1,400	68	10	60	17
San Bernardino	12,600	15,000	1,725	1,800	75	230	375	1,830	1,340	1,500	30,000	230
San Diego	1,948	6,305	868	970	853	136	401	821	2,121	803	5,370	320
San Francisco	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Joaquin	40,000	18,000	12,000	6,000	1,000	900	700	2,500	2,500	50	50	45
San Luis Obispo	6,000	10,000	4,000	3,000	800	500	500	600	400	200	200	3,000
San Mateo	16,840	3,160	2,175	1,792	3,920	989	480	380	178	40	125	110
Santa Barbara	6,423	1,025	3,045	802	145	226	425	1,824	1,373	1,489	3,856	2,066
Santa Clara	107,261	46,138	34,986	30,721	18,977	1,529	2,168	3,716	1,403	1,053	3,138	1,171
Santa Cruz	32,500	5,100	3,360	4,870	1,500	86	226	620	710	10	18	.....
Shasta	84,600	65,240	8,700	4,520	7,075	697	410	520	730	6	18	.....
Sierra	7,686	4,635	795	557	520	100	97	50	1	1	.....	.....
Siskiyou	63,000	5,15›	1,125	721	330	154	78	64	.....	.....	.....	.....
Solano	17,643	56,120	9,142	36,410	16,410	1,150	1,165	78,565	7,065	437	237	360
Sonoma	171,241	48,412	22,423	24,310	10,397	987	3,570	1,717	1,803	783	717	275
Stanislaus	5,600	7,800	1,670	950	430	.....	75	780	870	.....	20	.....
Sutter	26,000	30,327	6,149	6,124	7,826	1,332	975	8,102	1,996	96	151	12
Tehama	12,000	30,000	3,000	10,000	1,000	1,000	500	1,000	1,000	50	50	50
Trinity	17,550	7,800	2,350	1,875	340	116	56	32	.....	.....	.....	.....
Tulare	22,315	23,570	5,060	2,484	900	560	405	2,084	2,500	110	175	22
Tuolumne	75,000	95,000	18,000	14,000	8,000	5,000	1,900	2,400	1,600	.....	.....	.....
Ventura	431	376	90	71	23	42	11	148	78	....	8,000	93
Yolo	28,000	21,450	6,500	5,300	4,740	2,750	1,750	5,700	5,600	.....	.....	.....
Yuba	36,000	18,600	7,000	4,500	1,100	1,000	1,800	3,600	1,800	35	250	30
Totals	1,579,388	958,875	332,199	289,975	180,958	45,894	37,860	153,474	62,360	13,606	90,057	11,794

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of prune trees	Number of mulberry trees	Number of almond trees	Number of walnut trees	Number of grape vines	Gallons of wine	Gallons of brandy	Number of distilleries	Gallons	Number of breweries	Gallons
Alameda	7,371	1,150	59,299	2,413	627,611	100,000	2,000			8	226,200
Alpine										1	4,000
Amador	160	8,485	1,040	450	1,680,300	82,200	900			4	58,450
Butte	187	2,447	6,815	2,523	600,564	26,930				3	
Calaveras	74	513	225	160	552,600	44,030	1,060	18	1,080	6	27,350
Colusa	12	1,000	5,780	400	245,000					1	25,000
Contra Costa	182	4,270	700	3,250	478,490	90,220				1	
Del Norte			2	3	50					1	6,000
El Dorado		74	251	155	1,420,255	123,915	3,650	27			
Fresno	130	76	2,600	480	26,760						
Humboldt		25	30	60	4,600					2	15,000
Inyo		45	3	123	15,485					2	9,380
Kern	128	421	142	3,391	61,334					3	20,000
Klamath					1,984	980					
Lake	24	5,015	191	153	46,917					1	3,000
Lassen			12	143	3,640					1	1,200
Los Angeles	140	80,000	900	5,600	4,250,000	1,460,000	50,000	50	80,000	5	60,000
Marin			29	254	11,663	2,713				1	
Mariposa		100	25	60	350,000	12,000	1,500			2	10,000
Mendocino			62	78	31,370					5	12,000
Merced	77	845	868	353	175,982	7,930	1,170	2			
Modoc	22	28			2,080					1	12,400
Mono										1	
Monterey			30	80	15,000					2	
Napa	515	40,110	4,265	1,230	3,108,590	433,885	11,300	6	11,300	2	38,285
Nevada	207	51,620	240	967	340,000	20,000		12		15	126,147
Placer	426	44,915	1,107	430	806,642	59,812	3,505	8		5	64,404
Plumas			3	1	125					2	4,000

Sacramento	1,514	4,130	4,948	37,265	2,132,975	161,898	2,595	18	2,595	8	349,866
San Benito	95	13	65	14	376,440	3,000	300			1	20,000
San Bernardino	150	419	400	10,500	600,000	125,000	4,000	5	4,500	1	7,000
San Diego	75	90	1,387	511	100,201	5,000				2	20,000
San Francisco								6	1,200,000		
San Joaquin	275	750	500	750	1,000,000	71,000	2,138	5	2,138	3	65,000
San Luis Obispo	100	200	1,000	600	60,000					1	50,000
San Mateo	200	16,900	425	1,000	140,260					4	60,320
Santa Barbara	106	1,083	38,311	10,274	213,984	2,325	1,100	1	1,100	1	35,000
Santa Clara	6,507	1,593	2,878	2,716	1,213,085	128,329	72,436	5	26,887	5	2,500,000
Santa Cruz	8		120	360	262,275	70,000	1,200	2	1,200	4	90,660
Shasta	8	125	150	325	490,054	31,400	250	1	250	1	12,000
Sierra	2	4	18	36	1,336	150				7	
Siskiyou		9,416		346	75,250	400				5	29,640
Solano	662	336	5,228	3,080	690,629	125,300	5,000	9		5	215,850
Sonoma	2,052	5,164	4,873	4,130	3,603,385	365,510	2,220	2	4,000	4	52,650
Stanislaus		25	150	12	260,000	50,500	2,500	1	2,500	1	10,000
Sutter	237	6,813	1,322	1,956	607,273	75,325		2		1	1,500
Tehama	50	200	300	200	650,000	50,000	2,000	1	10,000	1	10,000
Trinity		10	8	16	21,560	575		1	150	2	15,000
Tulare	120	1,260	450	700	285,480	2,000		3		3	13,470
Tuolumne		550	55	300	1,400,000	75,000	1,200			4	43,000
Ventura	9		713	11	135,200	7,000	2,120	3		1	
Yolo	300		3,250	7,000	550,000	13,700		4		3	62,400
Yuba	225	500	9,000	500	470,000	30,000	1,800	8		1	400
Totals	22,350	290,720	160,070	105,359	30,196,429	3,858,027	175,944	200	1,347,700	144	4,386,572

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of horses..	Number of mules..	Number of asses...	Number of cows...	Number of calves..	Number of beef cattle.....	Number of oxen...	Number of neat cattle.....	Number of sheep...	Number of Cashmere and Angora goats	Number of hogs...
Alameda	8,747	632	8	6,600	3,629	3,351	30	18,172	60,338	1,640	3,068
Alpine	329	15	.....	230	263	293	54	840	1,075	.....	119
Amador	3,009	225	3	2,354	1,319	3,150	117	6,940	15,178	10	3,060
Butte	5,413	632	30	4,070	3,326	8,718	204	16,318	34,761	150	12,700
Calaveras	3,135	171	26	4,889	2,447	1,810	150	9,296	39,654	3,512	3,064
Colusa	7,691	1,369	32	2,091	657	6,401	.....	9,149	185,369	5	14,529
Contra Costa	5,196	581	8	7,910	4,315	6,222	2	18,443	13,155	1,122	5,081
Del Norte	578	137	2	940	879	553	56	2,428	596	.....	705
El Dorado	2,029	124	.....	3,068	1,024	3,009	221	7,322	13,152	.....	1,858
Fresno	6,700	536	30	34,785	7,900	6,875	270	49,820	576,450	4,795	12,638
Humboldt	5,717	866	10	14,692	8,000	2,472	441	25,605	73,148	50	7,506
Inyo	4,370	689	58	10,418	1,294	129	191	12,032	3,576	.....	1,435
Kern	4,716	419	68	1,030	345	2,995	152 *41,552	46,074	225,704	.....	3,439
Klamath	360	428	2	341	771	2,709	73	4,684	260	40	777
Lake	1,831	181	1	2,334	2,281	694	57	5,366	19,429	.....	5,046
Lassen	3,402	133	2	7,123	3,987	4,570	95	15,775	24,972	22	789
Los Angeles	11,100	1,500	110	4,500	2,500	9,900	170	17,070	500,000	115	5,900
Marin	2,733	101	.....	19,162	3,282	430	132	29,051	1,365	.....	857
Mariposa	1,667	295	69	1,858	1,450	4,000	77	7,385	51,048	150	3,355
Mendocino	5,677	565	14	4,521	2,591	763	317	18,712	118,976	263	11,041
Merced	4,529	852	10	11,293	2,154	1,425	6	14,878	330,652	.....	4,962
Modoc	2,874	424	12	1,020	908	16,085	210	18,223	22,800	124	1,345
Mono	1,594	187	13	4,633	3,493	2,549	132	10,807	2,039	.....	174
Monterey	7,200	210	.....	6,400	3,640	1,590	4	35,134	134,500	2,000	5,860
Napa	4,975	590	6	3,515	2,930	1,509	20	7,974	33,743	.....	4,980
Nevada	2,310	126	6	2,411	1,298	2,931	200	6,840	2,122	.....	1,675

Placer	3,062	277	16	3,345	1,757	317	380	5,880	50,901	1,280	3,202
Plumas	1,372	118	7	2,502	2,217	161	211	8,222	3,712	482	488
Sacramento	9,216	322	5	9,120	5,658	316	297	15,391	136,753	1,347	4,876
San Benito	3,209	211	5	3,340	2,532	374	2	6,248	71,349	125	3,162
San Bernardino	3,894	319	4	1,614	462	156	121	9,282	59,286	384	1,344
San Diego	5,435	598	79	10,480	2,233	6,167	183	18,632	114,857	1,203	1,240
San Francisco	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Joaquin	11,381	968	18	5,326	5,614	6,026	19	16,985	74,137	20	1,200
San Luis Obispo	6,827	400	25	8,342	9,609	3,152	40	37,908	256,223	1,096	5,111
San Mateo	3,469	364	.....	6,508	4,686	108	173	11,675	455	.....	2,080
Santa Barbara	4,076	369	4	4,503	3,717	5,371	7	13,598	431,486	.....	1,394
Santa Clara	11,058	496	27	12,262	5,102	13,946	46	45,594	43,813	1,567	7,846
Santa Cruz	3,017	148	8	3,788	1,366	2,469	453	8,076	1,690	109	1,500
Shasta	3,685	237	9	5,657	4,500	2,206	144	12,507	36,922	2	7,077
Sierra	927	105	12	1,052	1,030	2,080	82	5,288	2,460	8	615
Siskiyou	8,049	472	26	2,647	5,310	15,848	104	23,909	20,550	145	2,170
Solano	4,185	695	.....	2,859	1,831	3,556	19	8,265	24,731	50	6,500
Sonoma	9,964	762	11	17,271	12,368	1,032	137	30,808	81,960	423	12,265
Stanislaus	9,450	1,707	14	.....	.....	.....	16	9,662	218,000	779	3,400
Sutter	3,693	494	1	4,162	5,274	1,447	62	10,945	23,161	.....	3,045
Tehama	4,244	122	15	4,720	1,722	5,944	.....	12,386	143,632	20	5,033
Trinity	940	259	7	414	233	3,098	91	3,836	14,286	.....	564
Tulare	9,090	446	210	14,958	9,544	9,193	121	33,816	356,823	462	11,260
Tuolumne	1,858	157	56	2,409	*6,202	.....	58	8,669	10,010	2,705	558
Ventura	3,061	158	.....	1,376	735	175	.....	2,286	148,748	.....	1,701
Yolo	7,272	1,012	9	7,960	1,857	339	.....	10,156	60,726	.....	12,899
Yuba	3,395	325	9	3,553	1,882	4,182	94	9,711	27,269	.....	3,446
Totals	243,711	23,529	1,097	302,356	164,124	182,796	47,793	794,073	4,898,001	26,205	219,939

* Stock cattle.

TABLE OF STATISTICS—Continued.

COUNTIES.	GRIST MILLS.				Barrels of flour made.	Bushels of corn ground.....	SAWMILLS.		Feet of lumber sawed.....	Number of shingles made.....
	Steam power.	Run of stone.	Water power.	Run of stone.			Steam power.	Water power.		
Alameda	4	13	.....	.....	26,000	1,000	.....	.....	.....	.....
Alpine	.....	.....	.....	.....	.....	.....	1	2	1,000,000	60,000
Amador	2	5	.....	.....	4,780	17,000	4	.....	3,800,000	514,000
Butte	2	7	3	8	112,500	3,000	17	4	62,000,000	1,700,000
Calaveras	.....	.....	.....	.....	.....	.....	4	1	2,960,000	4,000,000
Colusa	3	6	.....	.....	30,000	1,500	2	.....	2,500,000	250,000
Contra Costa	4	11	.....	.....	.....	.....	.....	.....	.....	.....
Del Norte	1	1	1	2	1,600	100	3	6	8,125,000	50,000
El Dorado	.....	.....	1	1	.....	.....	8	3	1,628,500	.....
Fresno	.....	.....	2	4	1,400	7,300	6	.....	3,600,000	.....
Humboldt	1	1	2	2	5,000	800	11	2	50,000,000	10,000,000
Inyo	.....	.....	2	4	4,093	16,891	.....	3	982,657	165,000
Kern	1	2	2	4	12,000	3,000	3	3	500,000	100,000
Klamath	.....	.....	.....	.....	.....	.....	2	8	2,000,000	1,000,000
Lake	2	3	1	2	7,000	550	7	2	3,500,000	400,000
Lassen	.....	.....	2	3	3,275	120	2	3	3,000,000	95,000
Los Angeles	.....	.....	6	11	4,000	47,500	2	.....	20,000	.....
Marin	.....	.....	.....	.....	.....	.....	1	.....	600,000	.....
Mariposa	.....	.....	.....	.....	.....	.....	2	.....	1,250,000	100,000
Mendocino	4	5	3	3	.....	.....	14	4	60,000,000	2,500,000
Merced	.....	.....	2	5	4,500	17,000	.....	.....	.....	.....
Modoc	1	1	2	2	12,800	150	1	6	3,800,000	400,000
Mono	.....	.....	1	2	700	200	2	3	10,000,000	100,000
Monterey	3	4	.....	.....	.....	.....	.....	.....	.....	.....
Napa	2	6	2	3	10,990	9,140	.....	.....	.....	.....

Nevada							18	9	50,000,000	25,000,000
Placer	1	2			24,560	2,500	20	5	21,670,000	2,619,000
Plumas	1	1	1	2	28,000		2	4	800,000	
Sacramento	4	19	1	1	204.480	37,160	2			
San Benito	1	2	1	1	5,650					
San Bernardino			4	8	8,600	9,500	5		2,500,000	220,000
San Diego	2	5	1	2	1,200	500	1	1	500,000	100,000
San Francisco	8				665,000					
San Joaquin	4	17			84,000	6,500				
San Luis Obispo			3	4	6,500	1,000	1		250,000	
San Mateo	2	5			3,530		12		6,720,650	32,167,520
Santa Barbara	1	2			1,500	1,700				
Santa Clara	7	22	2	7	65,473	3,138	3	2	19,137,230	
Santa Cruz	3	7	1	3	21,893	3,286	15	5	27,600,000	9,500,000
Shasta			2	4	7,000	1,230	1	11	6,000,000	800,000
Sierra			1	2			11	9	6,500,000	290,000
Siskiyou	2	4	8	10	21,724	1,375	5	13	3,500,000	100,000
Solano	3	10			50,750	5,000				
Sonoma	5	10	2	4	20,000	1,850	14		49,874,350	2,815,000
Stanislaus	1	3	1	3	14,000	3,000				
Sutter										
Tehama			2	5	12,000	1,000	7	2	10,000,000	2,000,000
Trinity							1	9	1,400,000	
Tulare	2	6	2	4	15,720	1,650	3	2	6,300,000	500,000
Tuolumne			3	6	10,000	1,900	4	1	5,000,000	1,900,000
Ventura			1	2						
Yolo	3	9			24,000	15,400				
Yuba	3	15	1	2	178,000	12,000	3	2	3,000,000	
Totals	83	204	69	126	1,714,218	234,940	220	125	442,018,387	99,445,520

TABLE OF STATISTICS—Continued.

COUNTIES.	QUARTZ MILLS.		MINING DITCHES.			IRRIGATING DITCHES.		WOOLEN MILLS.		COTTON MILLS.		COAL.	RAILROADS.	
	Number.....	Tons crushed....	Number.....	Miles in length.	Amount of water used per day—inches..	Number.....	Acres irrigated.	Number.....	Pounds of wool used.....	Number.....	Pounds of cotton used.....	Tons mined....	Number.....	Miles in length.
Alameda	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	84.57
Alpine	3	.....	.....	.....	.....	4	4,500	.....	.....	.....	.....	.....	.....	.....
Amador	15	83,450	11	296	15,830	4	200	.....	.....	.....	.....	2,890	.....	.....
Butte	9	2,000	11	330	8,000	10	800	.....	.....	.....	.....	.....	2	58
Calaveras	40	31,000	22	490	3,090	.....	.....	.....	.....	.....	.....	.....	1	.66
Colusa	.....	.....	.....	.....	.....	10	3,000	.....	.....	.....	.....	.....	.....	.....
Contra Costa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	150,000	2	11.50
Del Norte	.....	.....	20	58	9,600	12	143	.....	.....	.....	.....	.....	2	3
El Dorado	30	.....	50	900	.....	34	2,127	.....	.....	.....	.....	.....	1	18.75
Fresno	.....	.....	.....	.....	.....	6	2,700	.....	.....	.....	.....	.....	1	61
Humboldt	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2
Inyo	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kern	15	20,000	4	50	1,000	8	15,000	.....	.....	.....	.....	.....	1	30
Klamath	4	150,000	.....	240	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lake	.....	.....	.....	.....	.....	2	20	.....	.....	.....	.....	.....	.....	.....
Lassen	2	200	6	15	850	3	1,400	.....	.....	.....	.....	.....	.....	.....
Los Angeles	1	4,500	4	21	2,860	52	23,740	1	50,000	.....	.....	.....	3	77.25
Marin	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	8.50
Mariposa	23	15,000	7	45	.....	50	150	.....	.....	.....	.....	.....	.....	.....
Mendocino	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Merced	.....	.....	.....	.....	.....	5	12,000	.....	.....	.....	.....	.....	1	36.75
Modoc	.....	.....	.....	.....	.....	8	3,560	.....	.....	.....	.....	.....	.....	.....
Mono	6	1,800	2	7	800	.....	.....	.....	.....	.....	.....	.....	.....	.....
Monterey	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49.90
Napa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	41

Nevada	43	100,000	78	730	40,000	.....	400	.....	.....	.....	.....	1	80.25
Placer	18	5,481	45	492	.....	10	750	.....	.....	.....	300	2	112.75
Plumas	11	50,000	.....	480	60,470	24	.....	.....	.....	.....	.....	.....	.....
Sacramento	.....	.....	5	77	5,700	2	30	1	320,000	.....	.....	4	63
San Benito	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	17.75
San Bernardino	2	331	2	5½	140	11	4,000	.....	.....	.....	.....	.....	.....
San Diego	7	14,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	10
San Francisco	.....	.....	.....	.....	.....	.....	.....	2	4,500,000	.....	.....	.....	12
San Joaquin	.....	.....	.....	.....	.....	2	5,000	1	150,000	.....	.....	4	92.44
San Luis Obispo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2
San Mateo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	25.50
Santa Barbara	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Santa Clara	.....	.....	.....	.....	.....	.....	.....	2	161,976	.....	.....	4	72.25
Santa Cruz	.....	.....	.....	.....	.....	2	350	.....	.....	.....	.....	1	2.25
Shasta	1	200	78	325	12,660	70	2,000	.....	.....	.....	.....	1	18.80
Sierra	23	.....	52	218	3,000	21	500	.....	.....	.....	.....	.....	2.50
Siskiyou	3	3,000	18	220	10,500	98	21,580	.....	.....	.....	.....	.....	.....
Solano	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	45.50
Sonoma	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	5[illegible]
Stanislaus	.....	.....	2	14	500	1	260	.....	.....	.....	.....	1	33
Sutter	.....	.....	.....	.....	.....	1	360	.....	.....	.....	.....	2	34
Tehama	.....	.....	.....	.....	.....	40	1,000	.....	.....	.....	.....	1	40.50
Trinity	.....	.....	236	440	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tulare	2	1,000	.....	.....	.....	25	12,000	.....	.....	.....	.....	.....	.....
Tuolumne	20	9,000	4	100	2,400	100	6,000	.....	.....	.....	.....	.....	.....
Ventura	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....
Yolo	.....	.....	.....	.....	.....	2	15,000	.....	.....	.....	.....	1	32
Yuba	3	.....	20	75	4,500	10	1,000	1	320,000	.....	.....	2	28.37
Totals	284	490,962	682	5,628	281,840	630	139,570	8	5,501,976	.....	153,190	54	1,213.74

TABLE OF STATISTICS—Continued.

COUNTIES.	ASSESSED VALUE OF PROPERTY.				Estimated total population	Registered voters	Poll tax collected
	Real estate	Improvements	Personal property	Total valuation			
Alameda	$23,664,946	$5,324,779	$6,081,142	$35,070,867	36,500	6,066	$9,734
Alpine	165,905	83,313	599,248	848,466	1,000	300	1,260
Amador	881,470	842,670	830,415	2,554,555	10,500	3,244	3,650
Butte	5,100,200	1,224,183	2,738,236	9,062,619	15,000	4,621	8,808
Calaveras	386,725	442,198	827,408	1,656,331	8,500	2,630	1,294
Colusa	5,586,157	741,557	2,812,136	9,139,850	15,000	2,600	2,400
Contra Costa	4,870,238	767,097	2,028,620	7,665,955	10,300	2,720	5,110
Del Norte	208,470	175,025	314,070	697,565	3,000	500	620
El Dorado	552,087	777,838	1,164,697	2,494,622	10,000	3,933	2,303
Fresno	4,639,634	361,827	2,555,965	7,557,426	10,500	1,137	1,405
Humboldt	1,706,004	765,255	1,935,784	4,407,043	12,420	2,484	1,513
Inyo	487,178	189,930	794,107	1,471,215	3,200	797	800
Kern	1,706,921	281,684	1,614,711	3,603,316	6,000	1,000	463
Klamath	273,290	101,455	217,779	592,526	2,500	456	1,669
Lake	937,091	406,334	575,685	1,919,110	.....	.....	.....
Lassen	258,025	201,576	705,673	1,165,274	2,200	686	493
Los Angeles	5,806,647	2,190,130	4,083,589	12,080,366	21,500	6,300	3,570
Marin	4,893,950	1,006,035	1,508,453	7,408,438	.....	.....	3,214
Mariposa	407,214	446,365	511,672	1,365,251	4,000	972	1,449
Mendocino	2,042,059	931,546	2,450,407	5,424,012	9,500	2,876	2,369
Merced	4,533,457	423,670	1,940,776	6,897,903	6,000	1,663	1,934
Modoc	224,896	31,760	747,089	1,003,745	2,400	689	.....
Mono	80,100	111,145	354,647	545,892	600	269	290
Monterey	5,705,362	1,394,820	2,450,433	9,550,615	8,700	2,650	2,308
Napa	4,565,115	1,431,740	2,031,969	8,028,824	13,950	3,100	4,559
Nevada	4,173,523	1,573,897	2,936,658	8,684,078	19,500	6,000	4,724

Placer	3,340,238	775,182	2,666,546	6,781,966	18,325	3,522	4,033
Plumas	626,964	273,275	513,882	1,414,121	5,000	1,087	1,310
Sacramento	7,902,281	5,170,760	10,635,949	23,708,990	36,000	7,000	12,146
San Benito	2,908,848	388,803	1,259,856	4,557,507	5,000	1,300	1,975
San Bernardino	833,413	255,812	580,366	1,669,591	7,400	1,760	700
San Diego	1,887,025	308,213	874,145	3,069,383	10,000	2,300	700
San Francisco	122,338,369	39,943,685	105,590,592	267,872,646	195,000	44,149	43,402
San Joaquin	11,819,609	2,764,399	5,842,113	20,426,121	25,000	5,450	6,973
San Luis Obispo	3,037,716	140,535	1,462,625	4,640,876	8,000	1,800	1,600
San Mateo	6,699,255	1,043,200	894,072	8,636,527	11,215	2,243	3,754
Santa Barbara	3,452,433	768,469	1,789,407	6,010,309	11,000	2,345	3,000
Santa Clara	19,423,605	4,505,990	7,775,971	31,705,566	30,000	8,795	17,289
Santa Cruz	4,038,621	1,181,685	2,030,344	7,250,650	9,300	2,078	3,087
Shasta	530,319	365,204	980,323	1,875,846	1,730	1,187	3,376
Sierra	1,004,315	518,814	772,188	2,295,317	5,100	2,202	1,403
Siskiyou	740,456	613,465	1,632,411	2,986,332	8,000	2,767	1,906
Solano	6,111,156	1,769,335	2,527,413	10,407,904	19,000	5,000	4,000
Sonoma	9,184,829	2,798,257	4,817,739	16,800,825	22,500	4,160	7,000
Stanislaus	4,571,834	897,632	1,957,300	7,426,766	8,000	2,174	1,345
Sutter	2,960,974	484,693	1,208,541	4,654,208	7,127	1,500	2,354
Tehama	1,212,488	799,200	1,866,937	3,878,625	5,000	1,485	584
Trinity	287,298	158,992	557,379	1,003,669	3,400	855	1,436
Tulare	1,382,387	816,852	2,096,992	4,296,231	9,500	1,800	2,330
Tuolumne	459,445	366,620	621,610	1,447,675	7,000	1,900	1,800
Ventura	1,204,790	208,500	1,497,775	2,911,065	3,600	783	536
Yolo	5,104,026	500,535	1,704,618	7,309,179	12,000	3,254	2,034
Yuba	1,829,755	1,571,635	1,924,790	5,326,180	11,000	3,100	2,440
Totals	$308,749,113	$91,617,571	$210,893,253	$611,256,939	726,967	173,689	$198,452

Meteorological Report.

METEOROLOGICAL REPORT.

By THOMAS M. LOGAN, M. D., Meteorologist to the State Board of Agriculture.

It has been claimed that the extension of civilization, the pursuit of agriculture, the drainage and reclamation of vast tracts of marshes, and particularly the felling of forests, have made great changes in the climate of the United States, especially in respect to temperature and rainfall. But whatever of truth there may be in the theories of man's agency in modifying climate, we cannot go beyond the results of the records, which have been made through a long series of years. Unsatisfactory as these records may be, they nevertheless constitute the only reliable data that we have for determining whether either of the climatic conditions just referred to are increasing or diminishing—stationary or periodic.

From an examination of the results of all the observations which have been collected by Professor Henry and published in the reports of the Smithsonian Institution, we find that there has been no material change in the average rainfall, when long periods of time are compared, however the annual amount may vary. The irregularities in the successive yearly precipitation, though found to be very great in the different groups of the stations where the observations were made, and into which they were classed for the purpose of being systematically studied, nevertheless do not obliterate the appearance of conformity to general laws. The only decided indications of any material change are found in groups one and two, comprising New England and the Middle States, where the rainfall seems to have steadily increased since the year eighteen hundred and eighteen, in the very district which has been most stripped of its clothing of forest. Thus the power of augmenting the fall of rain which has been largely attributed to trees, vaguely by some, who confound such an attribute with their power of attracting mists, and boldly by others, who assert that rain now falls where trees have been planted in tracts formerly rainless, cannot longer be logically entertained. We learn positively from the mean results, as tabulated, that the rainfall during one hundred and thirty-seven years has undergone no change on this continent. The humidity of the great aerial currents is quite independent of local causes. The winds, charged with moisture collected in other regions, discharge their rain with indiffer-

ence over wooded and unwooded districts, and the rainfall is not now more or less than it ever was.

The same conclusions may be drawn from the results of the temperature records, the fluctuations of which are found to be quite uniform throughout the entire country. Two or three years near eighteen hundred and twelve are historically known as cold years; and a reference to this period shows them to have been more extreme than any since, if we except the present Winter of eighteen hundred and seventy-four–seventy-five, in the Eastern States. Next in severity come the cold years eighteen hundred and thirty-five–thirty-six, and eighteen hundred and thirty-six–thirty-seven. The next coldest groups were eighteen hundred and twenty-three–twenty-four, and eighteen hundred and forty-three–forty-four. The high temperature groups are eighteen hundred and twenty-five–thirty, eighteen hundred and forty-four–forty-eight, and eighteen hundred and fifty-three.

It would seem that there are two classes of non-periodic changes—one less frequent and affecting longer periods, and another causing changes above or below the general line of these long periods, and belonging to periods of a year or two. Further than this we find no results worthy of special mention from these long continuous observations over our vast territory, and hence infer that man's agency in influencing either the temperature or aqueous precipitation is, as far as we are able to judge, altogether insignificant. Similar inferences are deducible from the results of the observations made on the Pacific slope. In the comparatively brief records herewith presented, there is no evidence discernible of progressive or retrogressive movements, either in the temperature or in the rainfall. But the question of the rainfall, or of the temperature, does not settle the question of humidity. The humidity of the atmosphere depends not so much upon the amount of precipitation in rain as upon the rapidity of the process of evaporation and drainage; and it is here that man's agency proves instrumental in modifying climate. Our country, which was once largely covered with an unbroken forest, is now, to a great extent, denuded, the decrease of the forests being at the ratio of seven millions of acres annually. The rain, which was gradually conveyed by the leaves of trees to a dense undergrowth and layer of fallen leaves and vegetable mould, absorbed it like a sponge, and whence it was transferred by the roots to the depths of the soil, now runs off by the nearest watercourses, leaving no supply of water during dry weather. The restraint of evaporation by the dense shield afforded by forest shade being thus removed, the sun pours down upon the unprotected soil and rapidly evaporates the superficial water. The natural consequence of all this is an increased dryness of the atmosphere. This conclusion, which is arrived at from general observation and practical knowledge, needs not the proofs that physical science affords by means of the wet and dry bulb thermometers. The facts are patent and intelligible to all, and can be measured in an uncovered district by the sensible diminution of a mountain stream after a day of intense sunshine. In California, on the eastern side of our great valley, in places where the upper lands have been cleared of trees, the rainwater descends impetuously in a torrent, leaving tiny streams, which flow steadily for many days, so long as the sky remains overcast, but cease altogether after a single day of sunshine.

In this connection, I would add that the rains are not now either lighter or heavier, or more fitful, than in former times, but there are fewer

woods to restrain the drops, which unite to denude the rocks of their soil, and to form the mighty torrents, conveying thousands of tons of detritus to fill up the rivers, as witnessed every Winter season. It cannot be doubted but that an extensive planting of trees in the valleys, at the head of the main ravines, where cachement-areas of twenty-two thousand seven hundred and forty-two square miles have been hypothetically plotted out, according to the projected irrigation plans of the United States Commission, would superinduce a more humid condition of the atmosphere, and lead to a more constant supply of water, in a region now arid and desolate, for more than six months in the year. The evaporation from such immense reservoirs as are contemplated by these surveys, would be simply enormous, and, if intercepted by the trees before being completely vaporized, the minute component vesicles of water would coalesce upon the leaves and branches, and fall in drops upon the earth. This is the mode in which trees might tend to increase the humidity of the atmosphere, and which furnishes a rational and potent reason for their general cultivation in the arid and semi-tropical climate of California.

The following tables of the meteorology of Sacramento and San Francisco, being representative types of the interior valley and coast climates of California, are worthy of close study and attention:

RAIN TABLE FOR SAN FRANCISCO.

Prepared by THOMAS TENNENT.

MONTHS.	1849.		1850.		1851.		1852.		1853.		1854.		1855.		1856.		1857.	
	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days
July	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.02	1	.....	.....
August	.....	.....	.....	.....	.....	.....	.....	.....	.04	1	.01	1	.....	.....	.....	.....	.05	2
September	.....	.....	0.33	4	1.03	1	.....	.....	.46	4	.15	3	.....	.....	.07	2	.....	.....
October	3.14	3	.....	.....	.21	2	.80	1	.12	2	2.41	9	.....	.....	.45	5	.93	3
November	8.66	8	0.92	7	2.12	5	5.31	12	2.28	12	.34	2	.67	7	2.79	9	3.01	11
December	6.20	12	1.05	4	7.10	14	13.20	20	2.32	11	.81	3	5.76	15	3.75	12	4.14	8
	1850.		1851.		1852.		1853.		1854.		1855.		1856.		1857.		1858.	
January	8.34	15	0.72	5	.58	4	3.92	11	3.88	10	3.67	11	9.40	13	2.45	7	4.36	8
February	1.77	5	0.54	4	.14	4	1.42	5	8.04	16	4.77	10	.50	4	8.59	15	1.83	8
March	4.53	7	1.94	9	6.68	14	4.86	6	3.51	11	4.64	12	1.60	5	1.62	6	5.55	8
April	0.46	3	1.23	8	.26	3	5.37	8	3.12	9	5.00	10	2.94	6	.....	.....	1.55	4
May	.....	.....	0.67	3	.32	1	.38	7	.02	1	1.88	6	.76	3	.02	3	.34	3
June	.....	.....	.....	.....	.....	.....	.....	.....	.08	2	.....	.....	.03	1	.12	1	.05	1
Totals	33.10	53	7.40	44	18.44	48	35.26	70	23.87	79	23.68	67	21.66	54	19.81	61	21.88	56

Rain Table for San Francisco—Continued.

Months.	1858.		1859.		1860.		1861.		1862.		1863.		1864.		1865.		1866.	
	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days
July	.05	2	.....	.....	.21	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
August	.16	2	.02	1	.....	.....	.....	.....	.....	.....	.....	.....	.21	3	.....	.....	.....	.....
September	.....	.....	.03	1	.....	.....	.02	1	.....	.....	.03	1	.01	1	.24	2	.11	2
October	2.74	4	.05	1	.91	12	.....	.....	.40	2	.....	.....	.13	3	.26	4	.....	.....
November	.69	5	7.28	15	.58	3	4.10	12	.15	3	2.55	5	6.68	8	4.19	10	3.35	12
December	6.14	14	1.57	6	6.16	21	9.54	16	1.80	8	1.80	8	8.91	18	.58	8	15.16	18
	1859.		1860.		1861.		1862.		1863.		1864.		1865.		1866.		1867.	
January	1.28	4	1.64	8	2.47	8	24.36	18	3.63	9	1.83	5	5.14	9	10.88	16	5.16	15
February	6.32	18	1.60	7	3.72	8	7.53	10	3.19	10	.....	.....	1.34	8	2.12	9	7.20	9
March	3.02	11	3.99	13	4.08	8	2.20	11	2.06	8	1.52	9	.74	4	3.04	12	1.58	7
April	.27	4	3.14	8	.51	4	.73	9	1.61	9	1.57	4	.94	3	.12	1	2.36	8
May	1.55	4	2.86	11	1.00	3	.74	5	.23	2	.78	5	.63	2	1.46	6	.....	.....
June	.....	.....	.09	2	.08	2	.05	1	.....	.....	.....	.....	.....	.....	.04	1	.....	.....
Totals	22.22	68	22.27	73	19.72	70	49.27	83	13.62	52	10.08	37	24.73	59	22.93	69	34.92	71

RAIN TABLE FOR SAN FRANCISCO—Continued.

MONTHS.	1867.		1868.		1869.		1870.		1871.		1872.		1873.		1874.	
	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days	Quantity	Days
July	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.03	2	.....	.....
August	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.15	3	.....	.....
September	.04	1	.....	.....	.12	1	.03	1	.03	2	.14	1	.....	.....	.08	2
October	.20	1	.15	3	1.29	2	.....	.....	.11	2	.21	1	.68	2	2.73	8
November	3.41	6	1.18	5	1.19	5	.43	4	3.72	9	2.62	3	1.31	6	5.92	7
December	10.69	18	4.34	11	4.31	7	3.38	8	16.74	14	7.25	10	10.12	20	.28	4
	1868.		1869.		1870.		1871.		1872.		1873.		1874.		1875.	
January	9.50	17	6.35	14	3.89	9	3.07	7	4.22	10	2.17	8	4.85	14	6.97	12
February	6.13	9	3.90	5	4.78	9	3.86	10	6.97	20	4.24	17	1.83	10	.20	*1
March	6.30	12	3.14	12	2.00	8	1.29	8	1.64	10	.78	4	3.55	15	.....	.....
April	2.31	9	2.19	5	1.53	4	1.93	5	1.10	7	.52	3	1.04	7	.....	.....
May	.03	2	.08	2	.20	2	.21	3	.16	3	.01	1	.34	4	.....	.....
June	.23	3	.02	1	.....	.....	.....	.....	.02	2	.08	1	.08	2	.....	.....
Totals	38.84	78	21.35	58	19.31	47	14.10	46	34.71	79	18.02	49	23.98	85	16.18	*34

* Up to ninth of February.

TABLE No. 1 OF RAINY DAYS AND RAIN IN SACRAMENTO.

Arranged accoraing to the seasons, showing the amount of rain, in inches, of each month during twenty-five years, and for each rainy season; also, the number of rainy and foggy days during which the amount of rain fell in each month in the same period.

Months.	1849.		1850.		1851.		1852.		1853.		1854.		1855.		1856.		1857.	
	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....
September.....	0.250	.....	0.000	.....	1.000	1	0.003	.....	0.000	1	sprinkle.	1	sprinkle.	.....	sprinkle.	1	0.000	.....
October.....	1.500	3	0.000	.....	0.180	2	0.000	1	0.005	1	1.010	11	0.000	.....	0.195	6	0.655	3
November.....	2.250	8	sprinkle.	1	2.140	5	6.000	12	1.500	5	0.650	2	0.750	9	0.651	10	2.406	10
December.....	12.500	12	sprinkle.	2	7.070	14	13.410	20	1.540	4	1.150	8	2.000	13	2.396	13	6.632	13
	1850.		1851.		1852.		1853.		1854.		1855.		1856.		1857.		1858.	
January.....	4.500	15	0.650	5	0.580	4	3.000	12	3.250	6	2.670	15	4.919	16	1.375	14	2.444	21
February.....	0.500	5	0.350	4	0.120	4	2.000	6	8.500	14	3.460	7	0.692	6	4.801	17	2.461	13
March.....	10.000	7	1.880	7	6.400	14	7.000	8	3.250	4	4.200	9	1.403	5	0.675	10	2.878	13
April.....	4.250	3	1.140	3	0.190	3	3.500	7	1.500	9	4.320	9	2.132	8	sprinkle.	1	1.214	3
May.....	0.250	.....	0.690	2	0.300	1	1,450	4	0.210	4	1.150	6	1.841	4	sprinkle.	3	0.203	4
June.....	0.000	.....	0.000	.....	0.000	.....	0.001	1	0.310	2	0.010	1	0.033	1	0.350	2	0.098	2
July.....	0.000	.....	0.000	.....	0.000	.....	0.001	2	0.000	.....	0.000	.....	0.000	.....	0.012	1	0.000	.....
August.....	0.000	.....	0.000	.....	0.000	.....	0.000	.....	sprinkle.	1	0.000	.....	0.000	.....	sprinkle.	1	sprinkle.	4
Totals.....	36.000	53	4.710	24	17.980	48	36.365	73	20.065	51	18.620	69	13.770	62	10.455	79	18.991	86

RAIN TABLE No. 1—Continued.

MONTHS.	1858.		1859.		1860.		1861.		1862.		1863.		1864.		1865.	
	Quantity.....	Days	Quantity.....	Days	Quantity.....	Days	Quantity.....	Days	Quantity.....	Days	Quantity.....	Days	Quantity.....	Days	Quantity.....	Days .....
September.....	sprinkle.	5	0.025	3	0.063	2	0.000	.....	0.000	.....	0.003	1	0.004	1	0.080	4
October	3.010	5	0.000	.....	0.914	9	sprinkle.	1	0.355	6	0.000	.....	0.120	2	0.480	5
November.....	0.147	11	6.485	15	0.181	5	2.170	12	0.005	2	1.490	7	6.718	9	2.427	9
December.....	4.329	17	1.834	17	4.282	20	8.637	22	2.327	11	1.815	10	7.867	16	0.364	9
	1859.		1860.		1861.		1862.		1863.		1864.		1865.		1866.	
January.....	0.964	19	2.310	15	2.668	10	15.036	20	1.733	10	1.077	7	4.776	13	7.699	18
February	3.906	18	0.931	14	2.920	9	4.260	11	2.751	11	0.186	2	0.712	6	2.010	11
March.....	1.637	14	5.110	17	3.320	7	2.800	15	2.360	10	1.303	12	0.481	7	2.018	11
April	0.981	6	2.874	8	0.475	4	0.821	9	1.693	9	1.080	4	1.370	3	0.476	6
May.....	0.981	4	2.491	10	0.590	3	1.808	9	0.355	2	0.742	8	0.460	2	2.252	5
June.....	1.037	.....	0.017	2	0.135	4	0.011	.....	0.000	.....	0.087	3	0.000	.....	0.100	2
July.....	0.000	1	0.549	3	0.000	.....	0.000	1	0.000	1	0.000	.....	0.004	3	0.018	3
August	0.030	.....	0.000	.....	0.000	.....	0.006	.....	0.000	2	0.085	3	0.000	.....	0.000	.....
Totals.....	16.041	100	22.626	104	15.548	73	35.549	100	11.579	64	7.868	52	22.512	62	17.924	83

Rain Table No. 1—Continued.

Months.	1866.		1867.		1868.		1869.		1870.		1871.		1872.		1873.		1874.	
	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....	Quantity.....	Days.....
September.....	0.000	1	0.006	1	0.000	.....	sprinkle.	1	0.000	.....	0.001	1	0.002	2	0.000	.....	0.050	1
October.....	0.001	1	0.000	1	0.000	3	2.120	2	0.020	2	0.210	1	0.220	2	0.310	4	2.257	8
November.....	2.426	8	3.806	6	0.774	5	0.850	5	0.584	6	1.220	8	1.930	4	1.210	5	3.801	9
December.....	9.511	21	12.850	18	2.612	11	1.962	7	0.971	6	10.590	22	5.388	13	10.009	21	0.440	17
	1867.		1868.		1869.		1870.		1871.		1872.		1873.		1874.		1875.	
January.....	3.440	15	6.036	17	4.790	14	1.371	9	2.075	8	4.040	11	1.230	10	5.200	14	8.705	14
February.....	7.104	9	3.147	9	3.630	5	3.236	11	1.919	11	4.740	18	4.360	17	1.856	9	.....	.....
March.....	1.010	6	4.348	12	2.942	12	1.642	6	0.690	8	1.936	10	0.551	4	3.050	10	.....	.....
April.....	1.805	7	2.306	9	1.240	5	2.120	7	1.454	6	0.610	6	0.512	4	0.890	10	.....	.....
May.....	0.008	1	0.270	2	0.648	2	0.270	1	0.756	5	0.280	3	0.000	.....	0.370	6	.....	.....
June.....	0.000	1	sprinkle.	3	0.008	1	sprinkle.	1	0.001	1	0.025	1	0.002	1	0.002	2	.....	.....
July.....	0.000	1	0.000	.....	0.000	.....	sprinkle.	1	0.000	.....	0.000	.....	0.015	2	0.001	1	.....	.....
August.....	0.000	1	0.000	.....	0.000	.....	0.001	1	0.000	.....	0.000	2	sprinkle.	1	0.000	.....	.....	.....
Totals.....	25.305	72	32.769	78	16.644	58	13.572	57	8.470	53	24.052	83	14.208	60	21.898	82	.....	.....

TABLE No. II.

Mean temperature of each month at Sacramento, since eighteen hundred and fifty-two, deduced from three daily observations; also, the mean temperature of each year, and the average of twenty-two years.

MONTHS.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.
January	43.00	43.00	43.71	48.02	48.54	45.03	44.87	46.20	47.12	46.41	46.87	49.17
February	50.00	51.00	52.50	52.64	50.25	52.24	50.49	49.83	52.17	47.50	47.96	53.65
March	59.80	53.00	54.82	57.03	56.42	53.74	51.47	53.30	55.05	53.58	57.62	56.07
April	61.00	60.00	58.06	58.80	63.27	59.80	57.11	57.82	60.65	58.05	59.46	62.12
May	68.00	62.00	60.20	63.91	65.51	65.19	63.03	58.48	63.70	61.25	67.14	68.48
June	77.00	67.00	71.10	71.06	71.93	69.43	74.85	65.64	66.18	69.33	69.08	71.10
July	75.00	80.63	72.55	75.12	71.45	70.81	69.07	73.17	73.57	73.19	75.63	74.84
August	71.00	69.47	73.04	69.59	71.31	70.57	67.16	73.50	69.73	75.00	70.66	74.70
September	76.00	65.05	68.01	70.93	67.93	68.90	65.89	67.59	67.78	70.41	68.98	69.83
October	78.00	60.01	63.01	58.04	61.49	59.51	63.28	59.76	59.91	67.60	62.84	64.54
November	53.00	55.05	50.65	52.18	53.24	54.23	54.05	53.47	53.60	53.15	52.74	53.53
December	48.00	47.93	45.99	43.86	47.37	44.47	43.52	49.34	50.93	46.44	46.49	50.18
Mean	62.57	59.51	59.47	60.10	60.73	59.49	58.73	59.01	60.12	60.16	60.35	62.82

Table No. II—Continued.

Months.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	Average, 22 years.
January	47.42	46.52	48.18	47.00	47.65	48.61	48.33	48.48	52.70	45.70	46.47
February	49.04	53.48	47.80	50.50	49.90	51.10	49.40	53.27	48.21	49.30	50.55
March	53.60	54.18	50.67	55.00	53.63	53.05	56.00	56.77	56.84	52.90	54.41
April	59.35	61.89	59.70	60.10	59.00	57.00	59.25	57.60	60.00	59.50	59.52
May	70.22	63.06	64.39	64.25	64.20	61.02	61.50	67.00	67.87	64.70	64.31
June	73.47	72.16	70.30	69.50	70.82	69.33	70.10	69.20	71.73	70.20	70.46
July	74.01	76.23	73.75	73.80	74.41	71.76	70.20	71.42	73.19	72.80	73.48
August	71.74	76.03	71.74	71.20	71.26	72.57	72.00	73.13	66.30	70.90	71.48
September	68.84	72.16	68.84	68.30	69.90	68.00	67.43	68.83	69.90	70.70	69.10
October	63.07	65.20	62.72	61.96	63.11	63.61	62.20	58.90	61.40	61.70	62.58
November	56.90	53.84	54.80	53.90	54.00	53.37	50.23	51.16	57.50	53.93	53.56
December	44.13	50.17	46.82	47.00	46.52	45.51	48.67	48.97	47.70	45.00	47.05
Mean	60.98	62.08	59.90	60.11	60.36	59.58	59.60	60.43	60.66	59.78	60.25

TABLE

Showing the mean temperature of each month for twenty-four years, in San Francisco (Dr. Gibbons), and of each month in twenty-two years, in Sacramento (Dr. Logan).

MONTH.	Twenty-four years, San Francisco	Twenty-two years, Sacramento.....
	° '	° '
January	48.90	46.47
February	52.05	50.55
March	54.73	54.41
April	55.78	59.52
May	57.83	64.31
June	59.73	70.46
July	61.00	73.48
August	61.84	71.48
September	61.40	69.10
October	60.00	62.58
November	56.18	53.56
December	50.33	47.05
Mean for twenty-four and twenty-two years	56.65	60.25

AGRICULTURAL REVIEW.

AGRICULTURAL REVIEW.

BY I. N. HOAG, AGRICULTURAL EDITOR OF THE SACRAMENTO RECORD.

The past year has been one of very gratifying prosperity to the material industries of California. It is with pleasure and State pride we turn, on this happy morning of the new year, to review the progress of those industries during the past twelve months, and then with renewed cheer and hope, gathered from the substantial successes of the past, to look forward to the promised accelerated progress of the future. But what is California that she should so engage the affections, stimulate the enterprise, and rouse the business energies of all her citizens? And why is it that she has sprung, as it were, with one bound, from the position of an unimportant territory of the United States to the foremost place in industrial importance among her sister States of the Union? And why is it that in so short a time she has changed her position, from that of an importer of all the food her people consumed, and all the clothing they wore, to that of the most extensive exporter of both food and clothing material in the Union, and in proportion to her population, in the world? Why is her wheat, her barley, her fruits, her mines, her stock, her every agricultural product, prized above that of her sister States; and why do they command the highest prices in the world's great produce markets and commercial centers? Why are the average individual accumulations of wealth in California, as shown by our material statistics, so much greater than in any other State or country? To an old resident of California the answers to all these questions are plain and easy, and for such we would not take the trouble to record them; but for the benefit of those in all parts of the world who have not seen this naturally favored land of ours, and who are consequently to a great extent ignorant of its many advantages of location, soil, and climate, we will preface our annual review with a paragraph devoted to these general subjects.

Our State lies between thirty-two degrees forty-five minutes and forty-two degrees of north latitude, is about seven hundred miles in length, and on an average, two hundred in width, and contains over one hundred and twenty million acres of surface. The Pacific Ocean washes it the entire length on the west, furnishing numerous harbors for the ac-

commodation of commerce, of which San Francisco Bay, located near the center of the State from north to south, is the largest and principal one.

The State is divided from north to south into three grand natural divisions—a vast plain or inland basin through the center, with the coast range of mountains stretching its entire length on the west, and the Sierra Nevada Mountains on the east—the two ranges coming together near the northern and southern boundaries. The northern half of this plain is drained by the Sacramento River, and the southern half by the San Joaquin—the former having its rise near the northern extremity of the State, receives through numerous tributaries the entire water from the inside watershed of these two mountain ranges and the northern half of the plain, and empties it into the San Francisco Bay through the Carquinez Straits. The latter, rising near the junction of the mountain chains at the south, collects, in the same manner, the waters from the southern watershed of these mountain ranges and the southern half of the interior plain, and conveys the same in a northerly direction to and through the same straits, and into the same bay. The northern half of this inland plain is generally called the Sacramento Valley, and the southern half the San Joaquin Valley, and the two, together with the thousands of smaller valleys on either side of the main valleys, and nestled in the foothills of the surrounding mountains, constitute the main agricultural portion of the State, and contain about forty millions acres of good arable land adapted to the cultivation of the cereals, and to general agriculture and grazing. Within the dividing lines of these mountain ranges, and not coming under the description of valley lands, we may mention the rolling elevations, or approaches to the high mountains known here as foothills, containing from fifteen to twenty million acres of good land for vineyards, general fruit culture, including all the semi-tropical fruits, and silk culture, and sheep and cashmere goat raising. In that section of the State immediately around San Francisco Bay, are a number of large inland valleys, some of which are drained by navigable streams emptying into the bay, among which are Napa, Sonoma, and Petaluma. On the opposite side of this bay are the Livermore and Santa Clara Valleys. All of these valleys are among the richest and most fertile portions of the State.

Along the seacoast, and stretching at right angles with the same into the western slope of the coast range, is another system of valleys, among the largest and most important of which are the Russian River and Salinas, the former of which is largely devoted to stock raising, and the latter to the production of the cereals. There are hundreds of smaller valleys along the coast, each being separated by broken and craggy spurs of the coast range, all of which are rich and fertile, and many of which are furnished by nature with small but safe harbors for coasting vessels to lie in while unloading supplies and taking on the produce of the section.

All south of the southern terminus of the great San Joaquin Valley, or plain, and consisting of Los Angeles, Santa Barbara, San Bernardino, San Luis Obispo, Ventura, and Kern Counties, is called Southern California. This whole section is one of great irregularity, being broken into fragments, and divided into valleys, high table lands, and cragged spurs of mountains, and embraces nearly one third of the surface of California, or about thirty million acres.

All that portion of the State lying north of the northern terminus of the Sacramento Valley, at which point the two ranges of mountains unite, is called Northern California, and contains the Counties of Humboldt, Del Norte, Siskiyou, Shasta, and Lassen, which together comprise about ten million acres, cut up into rugged peaks and mountain ridges and deep gorges and beautiful valleys. This is the best watered and the best timbered section of the State. It has a double system of rivers—one converging to the south and uniting in the formation of the Sacramento River, and the other emptying into the Humboldt Bay and the Pacific Ocean.

CLIMATE.

Having sketched a very general outline of the geography and topography of the State, we are prepared to explain to some extent the mystery of our uniformly mild but ever varying climates. We use the term climates, for the reason that not only does each section of the State, whether divided by nature into the central valley, with the Coast Range and Sierra Nevada Mountains on either side, or by imaginary lines, into Northern, Central, and Southern California, have a climate of its own, but each portion of the great central valley, and each lesser valley, whether in the Sierra Nevada Mountains or on either eastern or western slope of the Coast Mountains, has a climate peculiar to itself, each depending on the direction of the prevailing winds and its exposure to or protection from the same—as well as its exposure to or protection from the rays of the sun.

There are in our State two great natural climatic forces or causes, and each is in a perpetual struggle for the ascendancy over the other. These forces are the exterior and interior, or ocean and land forces.

The waters of the Pacific Ocean, washing the coast the entire length of the State, preserve an even temperature the year round, never varying but about two degrees—from fifty-two degrees to fifty-four degrees. The tendency of the land force, on the contrary, is to produce extremely cold weather in the Winter and extremely hot weather in the Summer.

SUMMER CLIMATE.

The direct rays of a vertical sun during the long days of Summer heat up the earth and the air to such an extent that but for the presence of the ocean and its cooling forces, the whole interior would become like an oven, too hot for the comfortable existence of human beings. The local atmosphere thus becomes rarified and dries and rises from the earth, thus tending to create a vacuum. At this same time the cold Arctic waters of the ocean come sweeping down in constant currents from the northwest along our coast, bringing with them cold currents of damp, heavy, and foggy winds, which, pressing against the outer wall of the Coast Range, rise and burst over at every depression and roll down through the adjacent valleys, by degrees slacking their velocity and force as they advance, and by degrees intermingling with and losing themselves and their dampening and cooling influence in the dry, warm atmosphere of each locality. As the Golden Gate, or entrance to the Bay of San Francisco, presents no barrier to the ingress of these winds, they come rushing in through this opening in great volume, and with a velocity and force proportionate to the heat of the interior. Striking the Mount Diablo range of mountains, which lie at the junction of the

great San Joaquin and Sacramento Valleys, and present an eternal barrier to their further direct progress, they deflect to the north and south, and, spreading out like a fan, roll along up either valley, carrying with them their cooling and invigorating influences through all the interior of the State. These influences are felt least, of course, further away from the point at which the winds pass in through the Coast Range, and at points where obstructions are presented to their onward progress through the main valleys, or to their entrance into small valleys either in the Coast Range or Sierra Nevada Mountains. This natural phenomena of the interior and exterior, or inland and ocean forces, presents a philosophical and truthful explanation of our general cool Summer climate, and of the variations of that climate according to the favorableness or unfavorableness of each particular locality for the entrance and influence of these ocean winds. It also explains why the extreme northern and extreme southern ends of the Sacramento and San Joaquin Valleys, though about six hundred miles apart from north to south, are each warmer than at their junction, and why there is so little difference in their temperature at these extreme points. In fact, it explains the mystery of the great variety of our Summer climates, including the absence of rain in all portions of the State; for though these ocean winds are laden with water, as they strike the land along the coast and bay counties, that water falls there as it comes, in the form of fogs and dews, but as it rolls over the heated earth and comes in contact with the warm, dry air of the interior, it assumes the form of vapor and is absorbed, and, rising high, is carried away inland beyond the boundaries of our State, and probably as far east as the Rocky Mountains.

OUR WINTER CLIMATE

Is produced by the same interior and exterior forces, but acting in a directly opposite manner, and producing in some respects diametrically opposite results. As the sun recedes to the south the land gradually cools, and the inland atmosphere grows cooler and cooler, and the thermometer in all the interior of the State would sink to zero and below but for the counteracting influences of the exterior forces. As Autumn approaches the cold currents of the ocean, from the northwest, gradually grow less and less, and the warm southwestern currents take their place, and wash our entire seacoast, bringing with them warm but damp, water-laden winds. These winds, like their counterparts of the Summer, rise and break over every depression of the Coast Range, and roll down into the adjacent valleys, and likewise sweep in great volumes through the Golden Gate, and are by the same obstruction deflected, and sent on their way to the north and south, through the great interior valleys, and, more or less, into the lesser valleys making into the mountain ranges on either side. But, as they sweep along, they meet, instead of a warm, dry air, as in Summer, to absorb their moisture and carry it off in vapor, a cold, frosty atmosphere hugging the earth, and presenting to their undercurrents a most perfect water condenser of nature's own complete construction. This condenser rapidly converts the vapor of these sea winds into drops, which fall to the earth in copious showers, dispelling the frosty tendency of the inland air, and covering the whole country with a delightful, balmy, spring atmosphere. Under its enlivening influence the dry, parched earth, left so by the Autumn sun, becomes moistened, the seeds upon its surface germinate, and

Spring spreads out its mantle of green over the entire country, from the southern boundary of the State to Mount Shasta on the north, and from the ocean-washed coast on the west to the rolling foothills of the Sierra Nevada. But as in the case of the cold Summer ocean winds, so these warm Winter winds meet obstructions on their way, behind which their influences are not so perceptible. So, also, there are some valleys along the ranges of mountains into which they cannot easily penetrate, and there, also, they are not so much felt, but there are, also, others into which they enter without obstruction, and thus in these create a climate rivaling the most delightful climates of the tropics. Thus creating in our wet as well as in our dry seasons as many climates as there are peculiarities in locality; and thus explaining the uniformly mild climate of the entire agricultural portions of the State during this season. From these specially favored localities come the early vegetables and fruits which intermingle in our markets and on our tables with the still fresh vegetables and fruits of the past season, giving us practical demonstration of the many unequaled advantages of our country. Though Spring thus pushes herself in to join hands with Autumn, and crowds out old white-haired Winter from all the valleys, still Winter lingers on the northern and eastern borders of the State high up on the Sierras, and despite his younger sister of the valley, for months holds there undisturbed possession. And, as if in revenge for having been driven out of the garden of Eden below, tears out his locks, and, throwing them beneath his feet, covers from view the last vestige of green in all his elevated dominions. And now and then, with an extra effort, sends down a three days' northern blast to sweep through the country below, or of a night sends his stealthy offspring, Jack Frost, to clip the tops of Spring's most delicate productions.

From the above explanations of the climatic causes, it will be seen that the strip of country most exposed to the ocean influences, including those counties about San Francisco Bay, must have the most even temperature—comparatively a cooler climate in the Summer and a warmer in the Winter. This same cause has its influence over a large portion of the counties composing Southern California, producing there an even temperature during the entire year. Wherever the ocean has most influence, there the climate is evener as between Summer and Winter and between day and night. The effect over the entire State is, even in the season of the warmest days, cool and invigorating nights, giving animation and vigor to all animated nature.

SOIL.

Having briefly described the geography and topography of our State, and traced from them the mysteries and advantages of our many-sided climates, we now come to the consideration of the formation and composition of our soils, which, in conjunction with our climate, has made our State the agricultural wonder of the world. Nearly all the valleys of the State are much of the same general type, having evidently been formed by the washing down of the decomposed rocks and soils of the surrounding mountains and the decay of spontaneous vegetable productions.

The rivers and creeks that run through and drain them have per-

formed an important part in their formation, and have assisted materially in the making of the soil of which they are composed. This proposition is evident from the fact that the immediate banks of all the larger rivers, and nearly all the smaller ones, after they have left the mountain gorges and flow through the valleys, are considerably higher than the land at a short distance back from them. In other words, the lands on either side of all our rivers slope gradually back to a line of lowest depression, which line generally runs about parallel with the river. Beyond this line again there commences a gradual elevation, which continues, varied of course by intervening creeks or other natural causes, up to the foot of the mountains. Such is the general formation of the great interior valley drained from the north and south by the Sacramento and San Joaquin Rivers. These immediate banks have been mostly elevated by fine sedimentary deposits brought from great distances and dropped on the occasions of overflows. This sediment, mixed with the decayed vegetable matter, has made a soil of the most fertile character, not only on the surface, but to the depth of hundreds of feet. Instances are frequent along these rivers where present vegetable forms have been found from thirty to forty feet below the surface while digging wells. The fertility of this soil is therefore absolutely inexhaustible, and to keep up its marvelous productions, all that is necessary is to gradually bring to the surface, by plowing a little deeper each time, the virgin soil that lies below. There are millions of acres of soil of this formation in the State in which there can scarcely be found a pebble or gravel stone the size of a small bird's egg.

Experience has proved this kind of soil to be too rich for the production of the cereals at a profit—the straw generally growing so large as to cause it to fall down before the seed has come to maturity. It is well adapted to the cultivation of all kinds of vegetables, including the sugar beet, and nearly all varieties of fruits. For stock raising, and the dairy, it cannot be excelled. Seeded to Chile clover or alfalfa, every acre of this description of soil will produce, without irrigation, three or four crops of excellent hay a year, averaging from one and a half to two and a half tons at each cutting per acre. Or each acre will keep in good condition the year round from ten to fifteen head of sheep, or from two to four head of cows. Near the towns this class of land is frequently rented for from twenty to twenty-five dollars an acre per annum, and yields a good profit to the tenant. Bordering on navigable rivers, these lands have the advantage of cheap navigation, a consideration which materially adds to their value. The width of this class of lands along the rivers varies on different rivers and on different points of the same rivers from one to three miles, and though of the same general formation, the soil also varies from a dark heavy to a light sandy loam. The same variation is also found in the composition of the different strata or layers of deposit of which these lands are formed. The strip of low land between the lands just described, and the more elevated shelf of lands towards the mountains on either side of the Sacramento and San Joaquin Rivers, in seasons of high water, when the river banks overflow, and the creeks from the foothills run full, constitute the main body of the swamp and overflowed lands of the State, of which there are about five million acres. In some sections these lands have been reclaimed by levees and drains, and are among the most productive and valuable lands in the State. Their soil is generally heavier, and contains less vegetable mold than those between them and the

rivers, and wherever reclaimed have proved to be the best lands for wheat and other cereals, as well as good meadow and grazing land. When all are reclaimed, as they certainly will be, these strips, averaging from three to six miles wide, will be worth from fifty to one hundred and fifty dollars per acre, according to locality.

The elevation back of these swamp lands toward the mountains on either side is generally very gradual, and the country presents the appearance of an immense flat plan, but is really generally composed of from three to four vast shelves, one back of and elevated above the other. These shelves, again, have been brought down from the mountains situate back of them, by the waters and glaciers that have been at work through ages of the past, and, like the elevations along the banks of the rivers, are composed of rich and very deep soil, though containing more mineral and less vegetable matter. These elevated shelves, or plains were originally covered throughout the whole length of the State with a most luxuriant growth of wild oats, frequently standing from eight to ten feet high, through which roamed the year round countless herds of wild cattle, in times when cattle were slaughtered in California for their hides and tallow, and when these latter products constituted the chief exports of the coast. They are now covered each year with vast fields of wheat and barley, and dotted over with villages, and farm houses, and farm establishments, and with vineyards and orchards. On these plains mostly have been sown the vast crops of wheat which have won for California the first place among the wheat-producing States of the world, and which annually put from twenty to twenty-five million dollars into the pockets of our farmers.

Still back of these plains come the rolling or foothill lands, lying at the feet of the mountain ranges which hem in the great inland valley. Here is the natural home of the vine and the fig tree, orange, and the lemon, and all the other kinds of fruit grown in temperate and semi-tropical countries. Here, too, on these rolling hills and intervening valleys, is the best climate and soil for the growth of the mulberry and the culture of silk in the world. Millions of acres of these hills are now occupied as sheep walks and Winter homes for stock cattle and dairies. The soil is new, and as compared with the general characteristics of that of the lower and leveler shelves, less fertile, containing but little vegetable matter, the finer particles having been carried further down the descent by the descending waters. The small valleys along the streams that make out of the mountains through these foothills generally have as fine and rich soil as can be found in the State, and in these small valleys may be found some of the most delightful homes on earth—homes that surpass in beauty and luxuries the descriptions of the first Eden. It is proper here to remark that for the last twenty-five years, since the gold mines of the mountains have been worked, nearly all the water running down from them has carried with it a much larger quantity of soil and sediment than before, and has in that many years probably done more in the way of filling up the swamp and overflowed lands than had been done in as many hundred years before the mining commenced. It is also proper to remark that as the mountains are composed of granite, slatestone, limestone, chalk, and various other mineral formations, so the soil made from the decomposition of these minerals is variously composed, according as more or less of these ingredients have entered into its composition.. In these foothill regions, therefore, the skilled cultivator of Europe can find whatever soil he desires, and what-

ever climate may be most appropriate for the culture of any particular product. The viniculturist from the celebrated wine districts of France, Germany, or Spain, can find here the counterpart in soil and climate of his most favored locality, and to reproduce here his favorite, requires but the application of his skill and experience. To make silk culture a success in these foothill districts, nature has done more than her part, and nothing is required but for man to bring to bear the tact and patience that have made this industry in some countries the richest in the world.

THE RELATIONS OF AGRICULTURE

TO

CIVILIZATION.

THE RELATIONS OF AGRICULTURE TO CIVILIZATION.

BY EZRA S. CARR, M. D., LL. D.

A complete history of agriculture has yet to be written. From the traditions of different nations, their works of art, and their literature, we find abundant evidence that however splendid the superstructure, the civilization of every nation has rested where it does to-day, upon the toil of millions for their daily bread—the satisfaction of the common wants of humanity.

Whatever may afterwards be added to improve, adorn, and elevate the social and spiritual condition of man, his relation to the soil remains unchanged; there is the basis of his prosperity. It was given him "for usufruct alone," not for consumption, and still less for profligate waste. Wherever the obligation to maintain the harmonious balance between organic and inorganic nature has been met, there we find the oldest and most permanent civilizations. Wherever the selfish pursuit of profit, the vile principle "after us the deluge," has been the ruling motive, the deluge has followed, leaving in its wake a human deterioration which corresponds with the destruction of virgin lands. From the old center and cradle of the race we may trace man as he flies from the arena of his own actions, in Palestine, in Greece, in Italy, in the north of Africa, and Spain, leaving behind him soils rendered infertile through the demolition of forests, "thorns and thistles," or the depauperated forms of once noble races of plants. Having reached the western limit, the tide of emigration must ere long return upon its course, to restore and recover the wastes it has created. Indigenous species of animals and plants needlessly extirpated, must be replaced by alien forms, and the balance readjusted as far as a better knowledge of the laws of animal and vegetable life will make such readjustment possible.

Civilization is a relative term. It does not consist in the multiplication or modes of supply of the artificial wants of mankind; it is the development of social order in place of individual independence and savage lawlessness. It is the improvement of the mass through the perfection of its units. This is a common sense view of the subject, and common sense, as Mr. Guizot says, "is the genius of mankind."

Civilization, therefore, determined by the character of the units of the social order, is susceptible of continual progress and the highest perfec-

tion. But it is dependent upon physical agents, chiefly upon climate and soil, which determine the most important conditions of human welfare.

The first step of progress is the *accumulation of wealth*, which in all regions of the earth is created by labor. The moment man produces more than he consumes the law of distribution comes into play, and we see a movement towards an organization of industry. It does not depend upon race. The same Mongolian and Tartar tribes which, wandering over the steppes and barren lands of Central Asia, never emerge from the rudest condition of pastoral life, because they never accumulate, have risen to the highest civilization whenever they have broken through the mountain ranges and descended into more fertile regions. The wild Arab, whom we know best as the Bedouin of the desert, transplanted to Persia or Spain, left noble architectures behind him, and made valuable contributions to literature and science.

Even the Indian races of the new world, wherever nature permitted the accumulation of the wealth derived from a genial climate and fertile soil, have left, as in Mexico and in Peru, splendid monuments of their advancement in the arts of life. Everywhere the basis is the same; it was rice and wheat culture on one continent, maize on the other.

How many ages were consumed in impressing the stamp of utility upon the products of wild nature, it is impossible to tell. Some of the most useful food plants are found in a wild state. Wheat in upper Egypt and the hill country of India; rice of excellent quality, though not identical in species, abounds in the North American Lakes.

But the wild wheat is a thin and comparatively miserable seed, unfitted for bread, and the wild rice, though productive, is black and coarse compared with its cultivated kindred. The noble proportion of flesh-producing material contained in wheat represents to us the flesh and blood of thousands of generations who have perished in bringing it to its present perfection.

As with wheat and rice, so all the varied products of our gardens and fields are trophies of man's conquest over wild nature, for to whatever he brings his intelligence he seems to impart an added beauty and utility. A wild plant or animal is only such in its relations to him, its separation, so to speak, from his uses; and the nearer animal life approaches to man in the scale of power and intelligence, the more capable it seems of entering into his service.

This process of assimilation began in the morning of time, and has left no trace of its earlier steps. The oldest agricultural records are seen upon the Egyptian monuments, where we find the foodful date tree everywhere represented. The banks of the Tigris, Euphrates, and the Nile, were doubtless the scenes of the earliest attempts at agricultural labors, in propagating and increasing the fertility of this tree, upon which both men and animals depended for sustenance. It is a singular fact that the date requires artificial impregnation. This fact was early discovered, and led to a simple festival known to this day as the marriage of the palm, in which not only the peasants, but camels, asses, and even fowls and dogs participate. The exuberance of vegetable life in the valley of the Nile, where a favorable temperature is constant, and where inexhaustible fertility is maintained by the periodical distribution of new materials, accounts for the speed with which wealth was created and population increased. Four hundred date palms may be grown on one and three quarters acres of land, each bearing a hundred pounds of fruit. From the rich soil of the river the lotus furnished a

nourishing seed or bean, from which the bread of the common people was made. Later the thourra, or millet, which now yields to the labor of upper Egypt a return of two hundred and forty fold, served the same purpose. All these plants, and their modes of culture, are described in the pictures and hieroglyphics which seem to defy the effacing finger of time.

We also find upon the Egyptian monuments the earliest records of the application of machinery to the cultivation of the soil. We see the plow represented, with handles to guide it, yoked oxen harrowing in the grain, laborers hackling it upon an implement set with sharp teeth, and herdsmen, distinguished from other laborers by their dress, bringing in sheep and wool. In the tomb of Menophres at Saccara, two bulls are represented. The symbolic worship of the bull gave a peculiar sanctity to bovine animals.

Not only does picture writing reveal the condition of the art of agriculture, but it gives us a glimpse of the social state. In a tomb at Erlethya we see a proprietor inspecting his farm. Before him goes a writer with implements; obsequious servants follow with stool and slippers, his bow and quiver. His dress shows what manner of man he was; he wears a collar and robe, and holds in his hand both scepter and staff. Two herdsmen bring in cattle, one prostrates himself, while the other is in the attitude of a person reporting the condition of the flocks. Upon the tablet is written, "cattle, one hundred and twenty-two; rams, three hundred; goats, one thousand two hundred; swine, one thousand five hundred." On another tomb nine hundred and forty-four sheep are mentioned as the property of the occupant.

Horticulture in all its departments was also carried to great perfection; the variety of gourds, cucumbers, melons, fruits, and vines, which added to the luxury of a vast population, is most surprising. Flax was grown in abundance, and the modes of its preparation for the spinner were identical with those now used. Their granaries, of which millions lined the banks of the Nile, are the models of the grain elevators of our own time.

But in all this creation of utilities man himself was left out of the account. What remain to us as monuments of a civilization falsely so called, are but stupendous and convincing proofs of a revolting despotism, based upon cruelty and upheld by superstition. "The very resources which the people had created were turned against themselves." The condition of the captive Israelites was that of the toiling millions upon both hemispheres, where the accumulation of wealth without its dispersion secured to the upper classes a monopoly of the very sources of power. National improvements are made which are the wonder of modern times, but the masses of the people received no benefit from them. The reckless prodigality with which labor was expended in works of doubtful utility showed the esteem in which it was held. A man was of as little account to the builders of the Pyramids as is the reef-making polyp to the inhabitant of the coral islands.

What was true of Egypt was equally true of India, of Mexico, and Peru, wherever the separation of a nation into castes divided society against itself, and planted the seeds of its dissolution in the ignorance of the masses of the people.

CHINA.

The notable exception which China furnishes to other ancient nations, is due to the fact that centuries ago she began to organize and practically develop the national intellect. She has thus to a considerable degree obviated the evils of caste, created a motive for industry and thrift, and maintained herself in permanent prosperity, while other nationalities have melted away.

China owes her immense population and wealth to the most thrifty and skillful agriculture practiced on the face of the earth, except in Japan and Holland. Shoo-Ming, who first substituted grain for raw meat, the primeval farmer, and the Emperor Wanti, who took the plow into his own hand and originated one of the great festivals of the nation, are more highly honored than those monarchs who aggrandized the Empire by the conquest of new peoples. One of their sagas, "Keep your lands clean, manure them richly, make your fields resemble a garden," though it has a modern sound to us, is of great antiquity. Scarcely any other country exhibits such practical obedience to the teachings of its prophets as China gives to those of Confucius, whose laws regulating labor are still carried into effect by the Government. As the Government, *i. e.*, the Emperor, is the universal owner of land, the only security the laborer enjoys with respect to its possession is the perfection of its culture. Though the law allows him to be dispossessed at pleasure, custom continues it in the same family for many generations.

There is sound statesmanship in the proclamation of Wan Choo Tung, Commissioner of Revenue of the Nan Kiang provinces, in the year eighteen hundred and forty-five, who desired to introduce the silk culture into his district. After a somewhat exhaustive lecture on the advantages of this industry, he commands "all our officers to assemble the village gentry and elders, and let them admonish the people and lay down the best rules, and let the same be published with descriptive plates. Let the father instruct his child, the husband his wife; then shall we see men at the plow and women at the loom; no laborer will be unemployed, and no resource of the soil be lost." Still higher patronage is given to this culture by the Imperial example. The Empress must make silk weaving one of her occupations, and to her is committed the homage due to the god of the silkworm.

Long before the era of European civilization, China appears to have understood the true relations of agriculture and the mechanic arts. The division of labor led to wonderful results in the perfection of manufactures and the extension of commerce.

Marco Polo tells us that the Chinese have used paper money since the year one hundred and nineteen B. C. We know they had established banks, and conducted financial operations by promissory notes and bills of exchange, at a very early period.

Every practicable spot in China is devoted to tillage, which is mostly accomplished by hand labor. Implements are few, light, and simple in construction. The *le* or plow is of wood, with an iron point, and is drawn by a single buffalo. Only the edge of the hoe is of iron; the harrow has teeth thickly set, and ten inches long, an excellent pulverizer. The bamboo rake, used for harvesting, gleaning, gathering scraps of manure, may be said never to leave the hands of the Chinese farmer. The bill-hook or *leen* is another instrument, serving all the purposes of pruning-knife, scythe, and sickle.

Six or eight acres is a large farm. Divided by belts or lines of carefully tended grass, instead of fences, these garden farms present a finished picture of the highest cultivation. Two and even four crops are obtained yearly from the same ground by alternating grain and vegetables. Liquid manure is freely used; ashes, oil cake, night soil, lime from bones and oyster shells, even human hair from the barbers, is carefully saved.

WAGES.

The wages of the lowest description of laborers averages about sixty cash (thirty cents) per month, and the cost of maintenance is from a dollar to a dollar and a half. Artisans, such as carpenters and blacksmiths, receive five dollars a month, with a corresponding increase in the cost of maintenance.

In the year one thousand and thirteen of our era, Tchin-Tsoung published the census of the industrial population, and reported twenty-one million nine hundred and sixty-six thousand nine hundred and sixty-five engaged in agricultural pursuits, not including women or young people under twenty-one years of age. In the year seventeen hundred and thirty-two the imperial taxes were removed from the tenants of farms and placed upon the larger proprietors; and for the further encouragement of a class of such vital importance to the Empire, it was decreed that the Governor of every city or village of a certain number of inhabitants should send to the Court the name of the most successful farmer, distinguished for good conduct and the good will of his neighbors, for frugality, and freedom from excesses. This wise and diligent agriculturist was thereupon raised to the dignity of a mandarin of the eighth order, by letters patent. He might visit the Governor, sit down in his presence, and drink tea with him. Respected for the remainder of his days, he should receive the honorable funeral of a mandarin on his decease, and while his name was written on the tablets of his ancestors, it would be cherished by the Government as of one who had rendered the highest service to his country.

JAPAN.

Of all countries Japan is the most remarkable for the development of her agricultural resources. There the agricultural interest has been protected by the most enlightened conduct toward the producing classes, who stand next in rank to the defenders of the State. A very interesting paper on this subject, contributed by Hon. Horace Capron to the report of the Department of Agriculture for eighteen hundred and seventy-three, shows that even in wheat culture we have much to learn from the large experience of this thrifty and intelligent people. The well known practice of the Japanese and Chinese in dwarfing plants, throwing their strength into fruit or flowers, at the expense of wood or leaves, is applied to wheat, thus shortening and thickening the straw, increasing the size of the heads, and rendering it less liable to lodge.

Japan is far too tempting a subject to be more than touched upon here. If "China is old, and immovably conservative," Japan, not younger in years, but in the spirit which welcomes new truths in science and new applications of these to the arts of life, is vigorous with an eternal youth.

In Japan we have a stable civilization based upon absolutism, imperiled by the existence of caste, isolated for unknown centuries from intercourse with other countries, yet maintaining itself within narrow limits by an almost universal, *practical* education, and the dignity ac-

corded to the pursuit of agriculture. The organization of the national intellect is as complete, and far more rational, than that of China. That Government may be considered as having builded "better than it knew," which discriminated in favor of the agriculturists in respect to educational privileges, for these classes are necessarily the most averse to the changes in government. Political disturbances and agitations, like war, are a constant threat to the prosperity of the farmer, and to him, sooner than the representative of any other class, may new ideas be intrusted with safety to the nation.

Japan gives us the highest example of national thrift, if the density of population in proportion to extent and original excellence of territory, is the test. The surface is broken by ranges of mountains, the coasts by bays and inlets, which render navigation dangerous, and the variations of temperature are excessive. Yet she feeds, clothes, shelters, and instructs a larger population than that of Great Britain. The perfection of culture which has enabled her to accomplish this, unassisted by foreign commerce, must be studied in detail to be understood. She has done it mainly by the most wonderful economy of fertilizing materials, and the perservation of her forests.

RURAL LIFE IN GREECE.

In that charming book which has woven the facts of a nation's life into a prose poem, President Felton says: "If the Greeks were preeminently a nation of poets and artists, they were no less preëminently a nation of farmers." Here for the first time we find the rural home. The pictures which Homer gives us of the scenes of rustic toil are fresh and enchanting as those in the pages of Whittier. Nor were the Hellenes unlike our New England forefathers in the virtues of thrift, and temperance, their proverbial philosophy, the wit which goes "like bullet to its mark," or weather wisdom. Like the American Indian, they knew the time of day by the turning of the leaves and the opening and shutting of flowers. The charm of Homer to the English mind is in the familiarity of scenes which are depicted in his immortal lines. The Greek mind absorbed beauty as the Greek body took in health, and wholeness (another word for holiness) from the earth it loved. "The love of rural life was one of the deepest passions of the Grecian heart, beyond the realm of Arcadia, real or ideal." Through the whole compass of Greek literature the sights and sounds of the country—the murmuring of the bees, the rising sun smiting the earth with his shafts, the rich meadows, the cattle feeding in the pastures—furnish images on which the city poets delight to dwell, and share with the sea the thoughts that move harmonious numbers. The plains of Attica were covered with rural homes, the country was full of little sanctuaries for the rural deities, nymphs, and others who frequented them.

In the Greek classics we not only find how much they knew of agriculture, but how little we have improved upon their knowledge. They knew the virtues of guano, fish, and seaweed in the corn fields—that land recovered its strength by lying fallow, that hay ricks might become heated and burn up. Though the grain was trodden out by cattle or horses on the thrashing floor, they had invented the flail, and a winnowing machine. And well they knew the value of the potent juice of those golden or purple clusters which grew on every tree and sunny wall. They trained their grapes from tree to tree, making lofty arches, beneath which the breezes could freely play, abundant currents of pure

air being regarded as no less essential to the perfect maturing of the grape than constant sunshine. The art of preserving the grape itself for the use of the table, either in a fresh state, or as raisins, was everywhere practiced.

The richest agricultural and horticultural contributions have come down to us from the master minds of Greece. They drew their inspiration directly from nature herself, and not from what some earlier writer had said about nature. The pupil of Socrates, the leader of the immortal retreat of the ten thousand, from his farm at Elis wrote: "Agriculture, for an honorable and high-minded man, is the best of all occupations and arts by which men procure a living; for it is a pursuit that is most easy to learn and most pleasant to practice; it puts the bodies of men in the fairest and most vigorous condition, and is far from giving such constant occupation to their minds as to prevent them from attending to the interests of their friends or their country. A man's home and fireside are the sweetest of all possessions."

Hesiod's "Works and Days" are devoted to the rustic lore which embodied the experience then attained. Nor can we fail to see how apt those Yankees of the Orient were to snatch every improvement, every new culture, from the nations they conquered, as we read Homer's description of the gardens of Alcinous, where flourished—

> High and broad fruit trees that pomegranates bore;
> Sweet figs, pears, olives, and a number more
> Most useful plants did there produce their store,
> Whose fruit the hardest Winters could not kill,
> Nor hottest Summers wither; there was still
> Fruit in his proper season, all the year
> Sweet zephyr breathed upon them, blasts that were
> Of varied tempers; these he made to bear
> Ripe fruits, these blossoms, pear succeeded pear,
> Apple grew after apple, grape the grape,
> Fig after fig; time made never rape
> Of any dainty there.

In Greece, also, we have the first example of public gardens created by the magistrates for the use of the citizens; and history takes account of the botanic garden founded by Theophrastus at Athens. Another was created by Mithridates, King of Pontus, one hundred and thirty-five years before Christ.

It is very pertinent to our subject to inquire how all this came to be changed—to find a reason for the Greece of to-day.* Mr. Felton ascribes it to the lack of a common central government, to the seeds of division planted by the predominance of the city over the country, to extensive migrations, and the formation of rival confederacies. All these were, doubtless, modifying causes, but we must look upon the Greek experiment at civilization in a broader light—it was one of many great experiments necessary to precede a conception of society in which the quality of the units should be of the first importance.

Plato looked with distrust upon popular governments. He considered the people little better than a mob, and would have subjected the individual entirely to the State.

Not so Aristotle, the father of a rational polity. He maintains that the legitimate object of government is not to increase the wealth of the

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*"Of Athens there remains only a small castle, a hamlet, undefended from foxes and wild beasts. Its people, once free, are now under the yoke of slavery to the cruelest brutes."—[Nicholas Goibel, a writer of the sixteenth century.

few, nor to favor the poor at the expense of the rich, nor to encourage mere equality, nor to promote trade and commerce only, but to make good and virtuous citizens, and to promote happiness. Those, therefore, who can contribute most to these results have the best title to a share in the government.

He proceeds to show that the middle, *i. e.*, the producing classes, who are exempt alike from the temptations of poverty and riches, are most likely to be governed by reason.

Nor was this great practical philosopher a mere utilitarian. "The most necessary and useful things," he said, "are undertaken for the sake of leading towards the most beautiful."

The military arm was only valuable in preserving peace. Labor was valuable in securing leisure for the highest enjoyments.

The decay of Greece began in the degradation of labor, through the introduction of slavery, and the growth of luxury. Education, at first exceedingly practical, aiming at bodily and moral, as well as intellectual, perfection, grew more and more one-sided, and ended in speculations upon philosophical subjects, mental gymnastics, as profitless in their relations to popular welfare as the theological dogmas have been which have divided the world. Agriculture became more and more subordinated to trade and commerce. The mines were all worked by slaves. The ratio of the free population to the slaves, who were brought from the shores of Asia, became as one to three, and as almost every eminent citizen was an owner of from fifty to one thousand, we can imagine the rapidity with which the thousand years of Grecian civilization drew to its close.

ROME.

Having shown that in the free States of Greece we find the elements of all that is best in society, and a recognition of the true relations of man and land, we will turn to Rome, where civilization presented the same phenomena of progress and decay. As in Greece, we find the supreme power of the State derived from laws made by common consent of the people, and that the division of land was made according to families, reserving a portion for common use. The early Romans had only two arts—War and Agriculture. Every husbandman was also a soldier, and as the laws forbade him to sell, or alienate his land, the growth of population naturally led to the establishment of a patrician class. The whole policy of Roman war and conquest rested on the desire to extend their territory, and with it the freehold system, of such vital consequence to the State. The Roman Government never lost a foot of land; every vanquished nation was compelled to merge itself into the yeomanry of Rome, or to cede a third part of its domain, which was thereupon converted into Roman farms. It has been well said, that many nations have gained victories and conquests as the Romans did; but none have equaled them in securing to the plowshare what was won by the sword.

The extent of a middle sized Roman farm was about twelve and a half acres, the chief crops, wheat and spelt, which is even better adapted than wheat to primitive cultivation. Peas, beans, and a great variety of vegetables, were diligently cultivated. The rearing of cattle for milk or meat does not appear to have been practiced until later times. From the Greeks they borrowed the culture of the olive, fig, and vine. The farmer and his sons guided the plow, which was drawn by the ox or

cow; horses, asses, and mules being used only as beasts of burden. The cattle, geese, and swine were kept in the agrarium or common pasture.

So perfectly was the plowing performed, and so closely were the furrows laid, that harrowing was dispensed with altogether. The farmer had many holidays—going weekly to market and keeping zealously all the religious and family festivals. After the Winter sowing, a whole month was considered a holiday.

At a very early period there seems to have been no distinction made between the rights of the large or small landholder in the common pasture, which was the property of the State, and not of the community. Day laborers were common, but there were few slaves, and as these were of the same blood and race, captives from Etrurian or Volscian neighborhoods, they were permitted and doubtless encouraged to work out their freedom.

A careful reading of Roman history, especially that part of it which relates to the division of society into two great classes, patricians and plebians, the differences that arose about the use of the common pasture, the concentration of land and capital into fewer hands, dispossessing the small farmers and cultivating estates with rural slaves, is necessary to a right understanding of the agricultural condition of modern Europe.

In the sixth century (Roman era) Roman husbandry consisted in the management either of the large estates of the aristocracy, or of the pasturage, *i. e.*, of the public or common lands, or in the tillage of petty holdings. Mommsen says, "the whole system was pervaded by the unscrupulousness characteristic of the power of capital. Slaves and cattle were now placed on the same level; they were fed as long as they could work, as a matter of economy, and sold when they were worn out, as a matter of economy also." One of Cato's maxims was that a slave must either work or sleep, and no attempt was ever made to attach the slaves to their estate or to their master by any bond of human sympathy. The abject position of the practical husbandman, not enslaved, is further shown in Cato's description of what a steward ought to be.

"He is the first to rise and the last to go to bed; he is strict in dealing with himself as well as with those under him, especially his stewardess; is careful of his slaves and oxen; is always at home; never borrows nor lends; makes no visits and gives no entertainments; troubles himself about no worship save of the gods of the hearth and field; leaves all dealings with the gods and with men to his master; he modestly meets that master faithfully and simply, and conforms to his instructions." By this time, such of the yeomanry as were not swallowed up by capital held small parcels of land, and were generally so poor that the hoe was substituted for the plow in their labors. The farmers were irretrievably ruined, and the more so that they gradually lost the moral tone and frugal habits of the earlier ages of the republic. The other branches of industrial arts were undeveloped, the force and energy of the population being consumed in war and commerce.

From the third to the fifth century of the Roman era capital had waged its warfare against labor by withdrawing in the form of interest on debt the revenues of the soil from the working farmers, and transferring the capital thence derived to the field of mercantile activity opened up by the commerce of the Mediterranean. There was no longer an agricultural class among the citizens, and though a high and even an improved culture was maintained, it was simply the application of the capitalist system to the produce of the soil. Cato, who regarded himself as a reformer, and had declared that farmers made the bravest men

and the best soldiers, states that Italy, at the end of the sixth (Roman) century, was far weaker in population than at the end of the fifth, and no longer able to furnish its former war levies.

The half savage herdsman who confronts the traveler in the Roman Campagna, is an unconscious witness of the estimation which noble and aristocratic Rome placed upon her citizen farmers while the nation was shaping itself. "She did not exactly desire their destruction, but allowed it to run its course, and so desolation advanced with gigantic steps over the flourishing land of Italy, where countless numbers of free men had lately rejoiced in well-earned prosperity."

GERMANY.

The development of agriculture among the Germans was retarded by the military spirit which distinguished them, and by a policy exactly the reverse of that pursued by the Romans. The Germans returned the lands to the people they conquered on condition of receiving military assistance, and required of their tributaries that one half the population should alternately fight and till the soil. The feudal system arose in their dislike of agricultural pursuits, and was entirely subversive of the freehold or allodial rights essential to their successful prosecution, and although these rights were preserved in some parts of Germany and France, the tendency to vassalage was almost irresistible. Indeed, there was no other security in those distracted times either for life or property, and the oath of fealty exacted from the peasant by the lord, was required of the lord himself to the next higher in authority, and so on until it rested at the throne, thus diminishing in all classes the sense of degradation.

Below the monarch in the long procession of nobility came, first, the Earls Palatine, then simple Earls, then companions in Germany corresponding to the Thanes of England, then the *ceorls* or tenants, and lastly the slaves or villains who tilled the soil. These aristocratic distinctions were engrafted upon Great Britain, with other Teutonic customs, during the Saxon ascendency.

GREAT BRITAIN.

Agriculture was introduced into Britain by the Gauls, one hundred years before the Roman invasion. The division of land followed the Roman custom, *i. e.*, it was divided into "hides," a hide being about as much as could be cultivated with a single plow, or from sixty to one hundred and twenty acres. No man was allowed to guide a plow who could not construct one. To reclaim land gave the use of it for five years. Just at this period the Saxon distinction between *folks land*, or the property belonging to the State and the people at large, and *bocland*, or private property, begins distinctly to appear; also, the system of rentals. According to the law of Ina, king of the West Saxons in the eighth century, a hide of plow land paid the following rent, viz: ten casks of honey; three hundred loaves of bread; twelve casks of strong ale; thirty casks of small ale; two oxen; ten wedders; ten geese; twenty hens; ten cheeses; one cask of butter; five salmon; twenty loads of forage; and one hundred eels.

In the time of Alfred the Great we hear complaints that arable lands were exhausted of their natural fertility, and three fourths of that which was susceptible of cultivation was devoted to pasturage.

Known in law as a churl or hind, the English farmer earned his black

and bitter bread, during the Middle Ages, with little motive for self-improvement or that of his lands. The plowman, shepherd, and swineherd belonged to the soil, and fishermen were rented and sold with the fisheries where they were employed. The cottager's house was a thatch covered hut, chinked with mud or clay, without chimney, window, or floor. A hide dressed with the hair on, swung like a hammock, served him for a bed; there were no mills except those operated by hand. He was his own tailor, tanner, and clothier. The kit of a blacksmith consisted of four pieces; a carpenter's of six. There was no division of labor. The plow, a pick, a clod breaker, spades, sickles, and baskets for winnowing grain, comprised the list of agricultural implements.

The allowance of the laborer was two herrings a day, a loaf of wheat or barley bread, and milk from the manor house, with which to make his cheese.

Twenty years after the accession of William, the Conquerer, nearly the whole territory of England had been wrested from its original proprietors and given away, making the condition of the agricultural population even worse than before. Still the art of agriculture progressed, thanks to the Monks, and the proportion of freeman increased in consequence of the necessity for handicrafts which required intelligence and skill. By the year thirteen hundred and seventy-six, forty-eight "mysteries of labor," as the various employments of saddlers, brewers, masons, etc., were called, had been established in London and were strongly organized into guilds and fraternities. But the laws strictly forbade the teaching of any mystery to a husbandman or the son of a husbandman. The mechanics having achieved an acknowledged political position as free subjects of the Crown, the agricultural serfs showed signs of following their example. A statute of the First Richard (thirteen hundred and seventy-seven) is made "at the grievous complaint of the Lords and Commons of the realm, that in many parts the villains who owe services and customs to said Lords have of late and do daily withdraw their services, and affirm them to be utterly discharged of all manner of servage, due as well of their body as of their said tenures, and will not suffer any distress or other justice to be made upon them, and which more is, gather themselves in great routs, and agree by such confederacy that every one shall aid the other to resist their Lords with the strong hand."

The memorable request of such a confederacy, headed by Wat Tyler, "for the abolition of slavery for themselves and their children forever, for the reduction of rent, and the privilege of buying like other men in fairs and markets," resulted in the addition of insult to the injuries of this long-suffering class. "Rustics ye have been, and are," the King told them, "and in bondage ye shall yet remain—not such as ye have heretofore known, but in a condition incomparably more vile." From that time it was enacted that all persons who had been employed in any labor or service of husbandry until the age of twelve, should from henceforth abide at the same labor, and be incapable of being put to any other business.

The evil effects of this irrational discrimination exercised towards agricultural industry, were not confined to the farming class, nor to England alone. Tenancy at will and tenant rights are more serious matters for English statesmanship to deal with now than they were

before the Great Charter secured personal rights and a trial by jury to every freeman born upon English soil.

At the time of the Norman conquest the population of England was supposed to be a million and a half, and the roll of land owners numbered over forty-five thousand. In eighteen hundred and sixty-one, with a population of twenty millions, the number of land owners is reduced to thirty thousand, and every twentieth man is a pauper. In Ireland, just before the famine, the rural population amounted to twenty-five for every hundred acres; in France, at the same period, to sixteen; in England, to twelve, and in the Scotch Lowlands, to five. Land monopoly had driven two millions of agricultural laborers out of Great Britain. The English farm laborer has been cheated of his manhood: First, by a *monopoly of government*, which, by withholding the ballot, kept him in a servile condition; second, by *monopoly of land*, which destroyed the highest motive for industry, viz: the improvement of his condition, and the attainment of a permanent home; and third, a *monopoly of education*.

In eighteen hundred and forty-eight, an English statesman was asked if something could not be done to check the stream of emigration from Ireland setting toward America. "Not while middlemen hold all the land as agents of the aristocracy, and get all the profits," was the significant reply.

Professor I. Thorold Rogers has given us a history of British agriculture from twelve hundred and fifty-nine to seventeen hundred and ninety-three. He shows, from carefully collected data, how gradually the emancipation of the agricultural classes took place, the aristocracy were eating each other up with expensive wars, and the extravagance of Courts; how the yeomanry lost ground during the Reformation, what was their Golden Age, and that the English peasant is again becoming a serf, and the yeomanry disappearing in the absorption of nearly all the land by a small number of great proprietors.

If the end of labor, and of wealth created by labor, is *man* himself, the civilization of England finds a parallel in that of Rome, and for the same reasons. Its agriculture, successful and wonderful in its results during the last century and a half, is an exhibition of the power of capital applied to land. The development of agricultural wealth, and of civilization in the United States, and in Australia, is an exhibition of the power of *manhood* similarly applied.

The advance in the price of agricultural labor in England has been slower than in other countries. In twelve hundred and seventy three, the haymaker got two and one half pence an acre; two and one quarter pence in fourteen hundred, with board; women laborers eight pence and fed themselves. The price for washing and shearing sheep was a penny a score, in twenty years sixteen were sheared for a penny, then ten, and finally eight. We read of one farmer at about the year fifteen hundred who gave his women shearers one and one half pence a day and fed them. And yet, Joseph Arch tells us that agricultural labor, all things considered, fared better then than now.

The price of meat and dairy products in England makes cattle raising more profitable than grain. Some one has said, and it is very near the truth, that a failure of the turnip crop for two years would bankrupt England. Agriculture is, therefore, growing in importance hourly, and so are all questions involved in the feeding of that vast and rapidly increasing population. England is increasing her acreage as fast as she can, by reclamation, and reducing her pasturage. The culture of sain-

foin, a crop good for six or seven years, has proved advantageous; also, of buckwheat for fodder.

In seventeen hundred and eighty nine million acres were cultivated; in eighteen hundred and sixty-nine, thirty-six million one hundred thousand one hundred and fifty-three; in eighteen hundred and seventy, forty-six million one hundred and seventy-seven thousand three hundred and seventy; of which eleven million seven hundred and fifty-five thousand and fifty-three acres were devoted to wheat culture. How far that goes in feeding the English millions is best seen by a statement of the imports of wheat and flour from the United States for the last fifteen years:

Year.	Cwt. Wheat.	Cwt. Flour.
1856	5,542,983	2,892,518
1857	2,819,934	1,464,867
1858	2,567,991	1,764,795
1859	159,926	216,462
1860	6,479,339	2,254,322
1861	10,866,891	3,794,865
1862	16,140,670	4,449,534
1863	8,704,401	2,531,822
1864	7,895,015	1,745,933
1865	1,177,618	256,769
1866	635,239	280,792
1867	4,188,013	722,976
1868	5,908,149	676,192
1870	12,372,176	2,154,751

SCOTLAND.

Of Scotch farming, it may be said that it has made great advances in the last century, chiefly from the superior education of the agricultural class. So great have been the agricultural improvements that it is said the climate is already perceptibly ameliorated, the Winters commencing a month later and the snow disappearing a month earlier. Until the breaking up of the clans and the large consequent emigration of the Highlanders to Canada, there was no husbandry in Scotland worthy of the name. It now produces the finest wheat in the United Kingdom. The farms range from fifty to a thousand acres; the latter, however, is exceptionally large. One fifth of the cereal crops are oats. The breeding of pedigree cattle and sheep commands the attention of the best Scotch farmers. The condition of farm laborers is far superior to that in England, and rural economy better understood.

Mr. W. Little, in a treatise on the technical education of farmers, says: "The success to which British farming has arrived is owing to mechanical rather than scientific causes. Drainage, steam culture, and a liberal use of capital, we have tried; but now chemistry, in its application to artificial manures, is taking such a prominent position, it is of the first importance that our farmers should be educated, should have such a general knowledge of science, as will serve them in their labors."

FRANCE.

French agriculture, like that of England, proves that industry requires freedom for its success. In lectures upon special cultures I have given the history of several movements, experimental and educational, which have been of immense importance to the nation; but the want of land is the great want of the French farmer. Small farming in the Department of the Nord is carried on to excess, "even to misfortune," according to French authorities. In spite of the developments of manufactures, the population is in the proportion of one to two and a half acres, or greater than in any country except China. France produces almost as much wheat as the United States, upon a territory not larger than Texas.

HOLLAND.

It is in that country, "redeemed by weeds from the dominion of the sea," that we find the laborer and the land enjoying the highest prosperity. There is no waste land in the low countries, and no waste of human power. Recreation with this frugal people is not so much rest as a change of occupation, and while neither art or any higher culture is neglected, there is no subordination of the useful to these ends.

Deep tillage is the characteristic of husbandry in the low countries, and the most perfect adjustment of the system of rotation to the special conditions of the soil. "No manure, no coin; no coin, no commerce," has been on the lips of the Fleming for generations. The following table shows the diversity of products which would be obtained from one thousand acres:

Products.	Acres.
Cereals and farm crops	387.34
Alimentary roots	50.66
Manufacturing plants	25.22
Legumes, pears, beans, vetches, etc	26.38
Fodder plants	59.83
Prairie land	139.19
Fallow	31.08
Gardens	19.17
Wood	186.58
Waste (at rest or periodically cultivated)	124.55
Total	1,000.00

A great deal of machinery is used by the large farmers. Tanks for the collection of the night soil are seen along the roadsides, parings of turf; animal droppings are carefully gathered and composted. Liquid manure is preferred on account of its freedom from weeds. A hectare is frequently treated with fifty one hundredths hectolitres, especially for tobacco. We cannot wonder at the enormous crops which are obtained. Dung pits are made for the excrements of cattle. Ammoniacal fertil-

izers are so perfectly saved that the stables are fresh and sweet as a Flemish kitchen; and besides all these natural resources, manure is manufactured in great quantities. The commonest way is to add sulphate of iron to animal manures at the rate of one kilo of the sulphate dissolved in twenty pints of water to the manure of twenty head of cattle. Cattle abound. The introduction of Durham cattle added one third to the value of this kind of stock; but other breeds are used.

The rotation practiced in Flemish husbandry is as follows: 1, potatoes; 2, rye, with carrots; 3, flax; 4, rye; 5, turnips; 6, oats. This is for a poor, sandy soil. For the best soils: 1, tobacco; 2, colza; 3, wheat, with clover; 4, clover; 5, rye; 6, oats; 7, flax; 8, turnips. We have here the great principles of successful farming admirably illustrated—rotation, fine tillage, high manuring. Even flax growing, considered in England an exhausting crop, is made beneficial to the soil of Flanders, and gives an average crop of thirty-three or thirty-four hundred weight to the acre. Between Ghent and Antwerp a cow is kept for every three acres of land. The beet-root is of immense value to Holland, and also to France and Germany, in supporting their cattle and in giving additional value to the manure.

The agriculture of Germany is rapidly becoming perfected through the ample provisions for agricultural education. The study of the details of experimental farming in France, Germany, Austria, and now in Russia, should be a part of the training of every American farmer. In no European country can the time-honored privileges of class give way to the necessities and claims of agricultural labor without a conflict, while in America, free lands, liberty of conscience, and free education, offer to it a prospect as boundless as it is inspiring. As every narrow sentiment of nationality is here becoming lost and merged in the more exalted sense of humanity, so the distinctions of class, and the jealousies between capital and labor, will lose themselves in an equality of education and the application of science to the laws of individual, social, and national life.

TOBACCO.

TOBACCO IN CALIFORNIA.

CULTURE OF THE PLANT AND CURING OF THE LEAF.

[WRITTEN FOR THE SACRAMENTO RECORD, BY A PRACTICAL TOBACCO PLANTER.]

The failures in making tobacco a profitable crop in California have been due primarily to the failure to cure the leaf successfully after the crop had been grown. There are thousands of men in California from all the tobacco-growing States—thousands of them practical planters. During the past twenty years many individuals among these have embarked more or less extensively in the enterprise of tobacco planting. There has been no failure in raising the crop—in securing, indeed, a heavy yield. But there has been difficulty in curing the leaf to a merchantable quality and condition. The sources of this difficulty have lain, not in the properties of the leaf itself, but in the arid, desiccating atmosphere of a California Autumn. This tended to remove from the leaf all its moisture before sufficient time elapsed for the decomposition of the green coloring matter (*chlorophyl*), the partial conversion of the starch into gum and sugar—the changes, in short, that in a moister atmosphere take place naturally in the plant after it is cut and before it is dried. These are the changes that constitute "curing," as distinguished from merely "drying up." The successful culture of tobacco in California required that a method should be worked out that would sufficiently promote these changes among the elements of the leaf, within the comparatively brief period during which it is able to retain sufficient moisture and vitality to admit of their taking place at all. None so well as old planters will perceive that the sole obstacle to successful tobacco culture is encountered after cutting, for none so well as they know the hardiness of the plant and the trusty generosity with which it repays honest and painstaking cultivation. The wide range over which the plant is grown in the United States ought sufficiently to assure even the unsophisticated, that there is nothing in its own nature to exclude it

from the soils and climate of California. From Wisconsin to Florida, and from Missouri to Connecticut, it is a staple subject of husbandry. On the continents of Europe, Asia, Australia, and South America, in the islands of the East and West Indies, it is grown of different qualities, cultivated by widely different methods, and cured by very various treatment. Even the inferior article raised next door to us, in Mexico, pays its way. It is manifest, therefore, on the face of the proposition, that the crop ought to be one of the staples of Californian and Oregonian production. Old planters, at least, know that where Indian corn will grow, tobacco will grow. The force of this consideration has no doubt had its weight in the series of attempts heretofore made in so many different localities in California, to produce good tobacco. Yuba, Placer, Stanislaus, Merced, Tulare, Sonoma, Napa, Alameda, San Mateo, Santa Clara, Santa Cruz, Monterey, Santa Barbara, and Los Angeles have all, within the recollection of this writer, contributed their experience—generally an unsatisfactory one—toward the common fund of knowledge, and no doubt a number of other localities ought to be added to the above list. This series of nearly uninterrupted failures has left in each locality its legacy of discouragement; more especially has it tended to confirm old tobacco growers in the belief that the crop cannot be made to succeed in California, because they have seen that the methods followed were approved ones—that the lack of success was not to be set down to the account of inexperience, but rather of experience. It is to such old planters that this paper is, in part, addressed. An attempt will be made to so point out the difference between the new methods and the old, together with reasons for each departure, as to command the assent of their judgments to the propriety of the changes. At the same time directions will be given for the culture of the crop and its management during curing, so full and minute that the farmer who has never seen a tobacco plant need not make a failure should he attempt the crop. To the first named, some of these directions may seem needless and tedious; to the second, the remarks upon old methods may appear only confusing and out of place; but if each will have regard for the needs of the other, and the obligation that rests on the writer to attempt to satisfy those needs as to both, the length of this essay will not probably be found to exceed the limits required for its best usefulness. Some remarks in elucidation of California husbandry, its methods, and the reasons for them, will doubtless be found superfluous by our experienced farmers, which may yet be useful to new comers.

THE SOIL.

QUALITY OF THE SOIL.

The soil for tobacco must be a loam. I have said that the plant will grow wherever Indian corn will; there may be some localities in the mountains of California, or in the northern part of the State, where the season between the killing frosts of Spring, and those of Autumn, may be too short to mature tobacco, notwithstanding that they may admit the cultivation of corn. Independent of this consideration, it may be said, in general, that good corn land may be expected to bring a satisfactory crop. It should be a piece of fairly warm loam, with sand enough to work free to the plow. As will be seen later on, the tobacco may be cured in the field without shelter. It is needful, there-

fore, that the curing should be complete before the rains. To attain this, it is needful that cutting should have begun, as a rule, before the middle of August. But in order that the plants may be sufficiently matured for cutting at this time, planting ought to have been concluded by the middle of May, and as much sooner as practicable. Therefore, planting ought to begin (for Central California) with the month of April, and in March, if possible. Further south, as from Los Angeles to Tulare, all tobacco work may be undertaken from one to two months earlier. But at this date, only a "warm" piece of land will, in general, be in fit condition to plant on. On "cold" land, though the plants may start, they will not be apt to begin making much growth before June. Then September may be well advanced before the crop is cut. If now it be hung to cure in the field, the odds are that it will be caught in one or two heavy rains before it can be stripped and housed. These will darken the colors—even if they do not spot and mold the leaves. The result is a rapid reduction in their value. And while good tobacco is one of the most profitable crops that is raised, poor tobacco may be quite the reverse. Bearing these needs of the case in mind, the judicious farmer will decide only at the last moment in the Spring whether or not he will set out tobacco on the land that he may have proposed for it. Should the season be a late one, and his land, after all, wet and cold, he may think better to seed it to some other crop. It will bring a rousing crop of anything else after having been tilled as I shall describe for tobacco. But when the season opens with no special rigor, and this land has been duly put in condition, let him plant with confidence. He is working in a surer plant than wheat, or beans, or potatoes, or any other crop I know of.

As to the effect of tobacco in "exhausting" land: an impression prevails that land cropped to tobacco is worn out in a few years. This belief is based, no doubt, on the notorious fact that extensive tracts have been worn out in the older tobacco-growing States, and confirmed, perhaps, by the circumstance of Connecticut growers expending large sums annually—ranging from two to three hundred dollars per acre—on manures for their tobacco lands. But it should be remembered that the Virginia and Maryland lands lasted near a century before they did wear out; that the generation has not yet wholly passed away that introduced the system of rotating crops on tobacco lands; that during the three or four generations preceding, the lands were cropped to tobacco without rest; that the Connecticut tobacco lands were already old when first cultivated to that crop, and then required manuring to produce good crops of anything. That it is only within the present generation that it has been found necessary to apply manures extensively on the tobacco lands of Cuba. That the extensive tobacco-growing operations long conducted in Ohio, with judicious rotation, have not yet impaired the quality of those lands. Finally, I may state, that there is a small field near Gilroy, in Santa Clara County, that has been cropped to tobacco for thirteen years, and still turns off as luxuriant crops as at the first. Some of the most available lands for tobacco in California are subject to overflow, which deposits on them a fine slime that is in itself the perfection of manure. So long as these lands continue to be thus renewed, they will probably be proof against exhaustion by tobacco, or any other crop. It is, of course, true that tobacco is to be accounted among the "exhausting" crops; but the terror in which it is held by some who are unfamiliar with its culture, is not warranted by facts. Tobacco gives a good rotation for wheat, and may

often do well on lands that have been weakened by repeated wheat culture. The exception to this statement should be when the lands have been exhausted of their stalk-forming food as well as of the particular elements required to mature the seeds of the wheat plant. On lands where wheat or barley tends to run to straw, and which are suitable for tobacco, this crop alternating with the grain, should improve the outturn of the latter.

PROTECTION.

The land, too, must not be too much exposed to the sweep of California Summer winds. The tobacco leaves, eighteen to twenty-four inches long and nearly half as many wide, brittle of stem and tender of web, present a great superficies to the wind, and a single norther may thrash out the leaves of a handsome crop—tearing the edges to rags, snapping the stems so that all that part of the leaf beyond the fracture withers away, and reducing the value of the whole stand in a serious way. A belt of wood or of hills to windward, is sufficient to avert this source of loss.

PREPARING THE LAND.

FIRST PLOWING.

As early in the season as practicable, the land should be plowed to a depth of twelve inches, *i. e.*, the plow should make a clean cut of twelve inches deep measured on the land side. The draft for this will require five good horses; of unusually large and heavy ones, four may do it. A gang plow, with one plow removed, will be found handier than a single plow. With several patterns of "gangs" the plow cannot be set down twelve inches. This should be looked to. To aid in turning the furrow a board may be jammed between the mold board and standards and secured so as to prevent the earth from pouring back over the mold board into the furrow. If to this board a sheet of tin or sheet iron be tacked, the slip will be the easier. This is not so important now as later in ridging, when it is essential to mold the earth high up, but is useful in keeping a clear furrow for the horses to walk in on the next round. I do not know any plow in the market that will turn a twelve-inch furrow clean over. A good deal of soil is bound to pour back over the mold board; the farmer must do the best he can with such tools as are procurable. Plowing should be done only when the land is in proper condition, and then it will be well if the lands turned each day be harrowed the same day. If the work be done by contract, a provision to this effect may save some disputing as to getting the land harrowed up to the satisfaction of the planter.

Tobacco is a rank grower during the months of July and August, provided it can get moisture at that time. The amount of growth made during the latter month especially, is the particular growth that gives the heavy crop. The deeper loamy land is stirred, the more freely and the later in the season will moisture rise in it. Good loam plowed twelve inches deep will in September show moisture from two to three inches below the surface. The same land plowed only seven or eight inches deep may, at the same date, be nearly or wholly dried out. Again, the deeper land is plowed the more freely does all excess of water drain away from the superficial layers, allowing it to warm, and the more

freely does atmospheric air enter its pores to warm it. Bearing in mind what I have said as to the importance of having the plants take an early start toward making growth (which they can only do in warm land), the importance of bringing the soil to this condition will be obvious. Further, the chemical action within the soil, by which plant food is formed, thus goes on more rapidly, and tobacco is one of the most avid consumers of food among all cultivated plants. And finally, the larvæ of insects—cut worms and other like pests—are turned up to the frost, which is probably the most effectual means of being rid of them during the coming season. Harrowing the lands the same day they are plowed is a generally safe rule for insuring the clods being properly broken and the soil brought to a condition of due tilth. The need of this will be apparent from these considerat ons: if there be clods in the soil when it comes to be molded into ridges, they will be thrown together in the body of the ridge. When the planter comes to prod the hole for the young plant, one of three things will be apt to happen: either, first, he will find a clod on top where his plant is to be set, when he must stop to break it with his foot, thereby delaying him; or, second, his prod will run into a clod that is covered over with loose earth, into which the rootlets of the baby plant must pierce for sustenance, when it will not thrive; or, third, the prod may penetrate into the cavity between two clods, in which said rootlers will be left dangling, when the plant will die. It ought to be obvious that the profit of the crop will depend in an important measure in getting a good "stand" at the first planting. Next to the exercise of reasonable care in setting the young plants, this is best insured by putting the land in thoroughly good condition to receive them. It is practicable, when all the work is well done, to avoid losing over one per cent to three per cent of the plants first set. It is easy, where any part of the work is slighted, to lose twenty-five per cent. Aside from the consideration of securing a good and early start to all the plants, the mere money cost of resetting dead plants exceeds several times over that of first putting the land in proper order.

Whether or not this deep cultivation can be done equally effectually by turning six or seven inches of soil and running a subsoil plow the remaining five or six inches, is matter for consideration. Perhaps after the first year's cultivation this plan would work equally well. In case the layer of rich surface soil should not be over six to eight inches deep, underlain by a decidedly barren subsoil, the subsoil plow ought undoubtedly to be used, and thus avoid bringing up the barren soil. It is to be remarked that no saving in labor, either of hands or team, would be effected by it, but as the draft would be lighter the work could be got through with by a lighter team—say only three good horses.

The very deep plowing here insisted upon may seem appalling to those who have never seen a plow run more than six or seven inches deep. Yet English farmers habitually plow twelve inches, fifteen inches, and even eighteen inches deep, for their ordinary grain as well as root crops. With horse-power, and in new soils, these depths are impracticable. Those farmers use steam, and those depths have been reached by a long continued system of cultivation that has progressively attained increasing depths. But it is observable that their experience has justified this system, and that it constitutes one of the elements that contribute to maintain the average yield of English wheat at thirty bushels to the acre. Tobacco, as grown in America, is a more valuable crop than wheat in England, and the planter ought not therefore to shrink from at least equal labor in its production.

The cost of all this thorough tillage (including the second plowing and "ridging" or molding up hereinafter described) may be taken at twelve dollars and fifty cents per acre. That is to say, a farmer could contract to do it at that price, and would get a fair rate of hire for his horses and tools, farm wages for the hands employed, and a reasonable price for the feed consumed. He would not make more than this, and if rains should interfere much with the work, compelling him to feed idle stock, he would not count that he had "made anything." But, taking one season with another, the above figure (twelve dollars and fifty cents per acre) will be found a fair one at which to estimate the total cost of preparing the land for the crop. This figure will appear small enough when it is remembered that the California planter raises his crop in competition with Eastern growers, one part of whom can plant their land to this crop only every third or fourth year, while another part expends twenty times this sum on manures alone, and where yield to the acre averages scarcely half the amount that the Californian can count on.

SECOND PLOWING.

A second plowing in the Spring is needed—partly to again loosen the soil which has settled and compacted under the Winter rains, and not less for the purpose of bringing to the surface more of the original surface soil that was turned deep under at the first plowing, at the same time turning back a portion of the subsoil that was then brought to the top, thus mixing the old and the new soils well throughout the whole depth. For it is to be remembered that in most soils the superficial portion only—for a depth varying from four to eight (more often six) inches—is really rich in plant food. There may be exceptions to this in pure alluvial bottoms, where the soil from any depth appears to be about equally capable of nourishing plant life. While deep plowing as described is necessary to insure the vigorous growth of the plant throughout its life, it is equally needful that it should have abundant food at each period of life; that is, that all the successive portions of soil throughout which its roots are to penetrate, seeking sustenance, shall be capable of yielding it freely. It may happen that by a single plowing a rich surface soil has been turned under, and a poor subsoil brought atop; in this, the young plants might make a poor and stunted growth, literally starving, while an abundance of generous food lay underneath—just beyond the reach of the little roots. Nor will the need for this second plowing be quite obviated by the next process of ridging; for if it be omitted, the land will commonly in ridging mold up more or less cloddy. Again, it will be found that the expense of the second plowing will be more than recompensed by the saving in the mere money cost of ensuing operations, while it will be returned many fold in the yield, and early outturn of the crop. Of course the harrowing will be as thorough and prompt after the second plowing as after the first, and should the harrow not properly accomplish its work, it should be followed by a clod masher. A roller is not effective for this purpose. A clod masher may be well made by taking two side pieces of three by eight stuff, ten feet long. Mortise in stoutly a front and tail piece of the same, eight feet long, set at an angle of sixty degrees with the ground, like the bow of a scow. Spike on between the sides of this frame a series of two by eight pieces, parallel with the two end pieces. The advantage of setting the cross pieces in this way is, that it gives such clods as pass under the forward pieces without

breaking a chance to roll up between the cross pieces, where they may be turned over and over, and will not be apt to pass from under the tail piece till they have been effectually reduced. The masher described is a heavy tool, and will require the whole team to manage it.

RIDGING.

Ridging may follow directly upon the second plowing, or it may be deferred—according to the season and the degree of forwardness of the young plants in the plant-beds. It should be done at least two weeks before the plants are set, in order to allow the moisture to rise fully in the ridges. And it is desirable that it should not be done earlier than is needful, lest the ridges should be subjected to rains that may so settle and compact them as to retard the early growth of the young plants. Although the soil that is molded into ridges is necessarily moist at that time, yet it must not be immediately planted on; for it parts with that moisture to the atmosphere—dries out; and if young plants have been set they will die; afterwards, moisture will rise into the ridge from below—a capillary action, the earth of the upper part of the ridge acting as a mulch towards that underneath it, and this moisture will be permanent, in which the young plants are to be set. Preparatory to ridging, the land to be planted should be laid off into rectangular blocks (of about two acres each will be found a convenient size, say two hundred feet by four hundred feet), the longer side running east and west, leaving a twelve foot road on every side. The ridges will run the way of the shorter sides, north and south. Should the lay of the land render it much more convenient, their course may vary anywhere within the quadrant southeast northwest to southwest northeast. The object is to so set the plants that the rays of the sun, as it sweeps around to the southward of us, may penetrate between the rows and reach all the plants. The plow for ridging (a twelve-inch one will be found a good size) must be set to run deep, but held by a slide or wheel at the end of the beam to run at a depth of six inches. A clevis must be made for the purpose (should be made of best Swedish iron), quite nine inches long, in the front vertical bar in which the draft-holes are made; then set it well to the off side of the beam, so that the plow may travel exactly behind the near horse, or, in other words, give the plow land enough to travel as stated. Start from the southwest corner of the first block and travel north; this turns a six-inch furrow to the east. Turn and travel south, starting three feet east of the first furrow; this turns a six-inch furrow to the west, which will be heaped up on top of the first one. Next turn and travel north in the last furrow; the plow being set to run deep will take up six inches out of the bottom of the furrow and turn it east; turn again and travel south, starting in three feet east of the last furrow; this (as before) turns a six-inch furrow west, which is heaped on top of the last one. Then turn north in the last furrow again, which plows up from the bottom, and so on. For this operation the extra (wooden) mold board spoken of under the caption of "first plowing" will be found useful, if not needful. The land will thus be molded up into a series of steep ridges running north and south, and three feet apart.

From this description of the operation of ridging it will be seen that the plow cuts and turns only two feet out of every three of ground, leaving a strip one foot wide under the center line of each ridge unturned. This center strip, through which the moisture must chiefly rise into the

ridge, is precisely the one that it is most important to have in a light and free condition. If the second (Spring) plowing has been omitted, this strip will have been left in the compact state in which the soil remains after having been settled by the rains. And in this lies one special importance of the second plowing.

If a soaking rain comes after the ridges are molded up to settle and compact them, and there be time before planting to throw them down, mold up again and have them "draw;" it will be found worth while to do so.

PLOWING TOO WET.

I have not thought it needful to enlarge upon the propriety of plowing only when the ground is in proper condition—*i. e.*, neither too wet nor too dry, but specially (in California) when not too wet. The high fertility of many California soils is partly due to the extremely minute division of their constituent particles. While they are not a true clay, they work like a clay.

If a portion of clay or of the "sticky" soils be saturated with water, and water afterwards allowed to drain off and the soil to dry, it will crack, fall perhaps to pieces, and at all events break readily in the fingers. It remains somewhat porous, as can be proved by setting the edge of a fragment in water, and observing its gradual permeation of the mass. Of course, where water can enter, atmospheric air enters; and such a piece of soil exposed to the weather will develop all the conditions needful for the support of plant life. If, now, an equal portion of clay or similar soil be saturated with water, and the water expelled by pressure and the soil dried, it will compact into a sort of brick-stuff. It is no longer friable, and will probably require the blow of a hammer to fracture it. Exposed to the action of water, it will disintegrate slowly at the wet surface, the fluid penetrating but slightly into the interior. It is obviously unfitted for the favorable development of plant-life.

When these soils are plowed too wet, turning over from the mold board in glistening ridges that preserve the curve of the implement, the process going on is that just described. They are being compacted and their water expelled by the pressure of the plow, and they are then molded into clods that may not again become fully disintegrated for two or three seasons. The harrow may divide these molded clods into smaller ones, but in that form they will dry out and bake. They will not receive seed nor supply nutriment, nor even standing ground to the roots of the growing plant, till their constituent particles are once more divided, which comes about gradually under the combined influence of the germination of wild seeds within their substance, of rains, frosts, and the Summer's heat. There are not many single operations performed on a California soil in the California climate, by which the husbandman can inflict more vexations or more serious injury on his crop, his land, and himself, than by this one of plowing when the soil is too wet; but, bad as the operation will prove in the case of an ordinary grain crop, it must be incomparably worse in that of tobacco, for the reasons heretofore set forth. The one leading object of all our operations has been to bring the land to a condition of tilth as nearly perfect and uniform as possible throughout a depth of twelve inches. Yet if the ground be stirred at all while too wet, it is placed beyond the possibility of being brought to that state by any operation known to our husbandry.

RAISING THE PLANTS.

PREPARING SEED BEDS.

For seed beds select a piece of light, warm soil (rather sandy is better) contiguous to water—a pond, slough, or creek, if possible—if not, then to a well. If well water is to be used, let a tank or reservoir be prepared, in which two days' supply can be stored. Well water should be only used after one day's exposure to the weather. The best locality for seed beds should be on the southerly slope of a slight undulation, towards its summit; swales lying below the general level of the land are commonly cold, and should a swale cross the land selected for beds, it will be better not to make them on this portion of it; that is, skip the swale. A fence or building on the north side of the beds will stimulate the growth of the plants, partly by the protection it affords from the north, but more by the heat it reflects on the beds. Should such a structure be available, therefore, it is worth while to whitewash it.

The beds are to run east and west. They are laid off three feet wide, with two-foot paths between. At each one hundred feet of length cross paths are to be laid off. This divides the beds into lengths of one hundred feet, each of which ought to give thirty thousand plants, coming on in a succession over a period of six weeks. If it be desired to complete the planting in less time, proportionally greater length of bed must be sown. It is well enough, though not essential, to burn over the ground in the Autumn, mainly for the purpose of destroying foul seed. The best way to do this is to haul on the ground a lot of straw, as much as, when settled, will give a foot in depth. On top of this throw a lot of dry brush. Touch it off when in condition to burn quick, and it makes a savage fire, heating the ground to a high point, and effectually destroying the vitality of all seeds that lie within a depth of three or four inches. If brush only be used it is difficult to heat the outer portion of the ground effectually, and at least it will not be done uniformly. Seed beds should be planted by the middle of January (or even by the first of that month), in all localities where there is not a probability of the ground actually freezing after germination of the seeds has begun. Mere frosts, however sharp, need not be regarded. In the southern part of California, say about Los Angeles on the coast, and from King's River south on the interior plains, this work may be better done in December, and seed may there be sprouted (as hereafter described) for planting about this time.

Having lined off the land into alternate beds and paths, chop up the surface of the beds well with a hoe to a depth of not over three inches. The "plantation" pattern of tool, cast-steel, will be found more serviceable than the common garden "gooseneck." Then, with rather a long-toothed garden rake, work out thoroughly all lumps and stones to a depth of at least two inches, leaving the earth as fine as it can be made. Work always from the north line of the bed, to the surface of which a slight slope to the south will thus easily be given. The amount of this slope should not exceed one inch in the three feet of width. This slight slope will be found to sensibly increase the effect of the sun's rays in warming the soil and stimulating growth; proof of this is furnished by the fact that some planters have made their beds

slightly crowning, when it has been observable that the plants on the south side of the bed were always more advanced than those on the crown, and these were more advanced than those on the northerly slope. This slight slope is also sufficient to insure against water collecting, and standing on the surface; while if the slope be greater, there is danger that the minute seeds may be washed away. All bed work should be done by the line. Along the northern line of each bed, after they are sown, a six-inch or eight-inch board is to be set on edge, held in place by pegs fifteen inches or eighteen inches long, firmly driven into the ground on each side of the board.

COVERS FOR THE BEDS.

The beds are to be covered by light frames; to which thin, unbleached muslin (technically known as Ashly Brown 4–4) is tacked. This can be bought at seven to eight cents the yard. If redwood lumber or clear Oregon pine can be procured for the frames, the size of stuff may be one by two inches. Size of the frames, twelve by three feet. If the more brittle pine of the Coast Range is to be used, it should be one by three inches (clear), and the length of frame may then be made sixteen feet. The lighter the frames consistent with strength the better. Nail strongly together with one center and two diagonal braces. If the heavier material be used, the diagonal braces had better be shorter to save weight—as the covers will be heavy and clumsy to handle at best. Do not cut out the frame stuff at the corners, which weakens it too much. Nail all the cross pieces on the same side of the long pieces. The sheeting stuff should be well backed along each frame piece, including the cross braces. These covers will be placed over the beds, one of the sides resting on the board previously fixed to receive them, the opposite side resting on the opposite (south) line of the bed. The frame should not project over the board lest a strong wind take it and tip it over. As the young plants grow, this (south) side of the cover can be raised by setting small blocks under it. It should not need to be raised more than two inches, as the plants will be ready to set out before they become large enough to require greater space. If the beds are where leaves or other trash blowing about can get under the covers, the open spaces at the ends of the beds should be closed with boards. This will also prevent strong winds taking the covers at the ends and tipping them over.

SOWING THE BEDS.

The different varieties of tobacco, the uses to which they may be severally put in manufacturing, the methods that may be followed in curing in order to secure a product specially fitted to these different ends, will all be considered under the head of "curing," in subsequent papers of this series. It must suffice here to say that for low alluvial land, in which moisture will be coming freely throughout the season, the "Connecticut Seed Leaf" will be found specially adapted. On land from which the moisture should begin receding toward the end of the season, the "Florida" plant should do better. The "Havana" variety ought to be planted only on the moist alluvions. "Orinoco" (or Virginia) may be substituted for "Florida" on upland, but in four cases out of five a crop of the last named ought to give the better money result. Provide a box six inches deep and of any convenient size—say six to ten square feet area; and if more than one variety of seed is to be sown, provide

one such box for each variety, and mark each box accordingly. The purpose of this is to avoid mixing varieties, which is almost inevitable where the same box is used for all, and will be found vexatious later in the season, as will be seen when the different methods of handling different varieties are considered. Next, sift of wood ashes enough to fill the box to a depth of nearly four inches, which will be about eight quarts to each square foot of area. Slightly moisten them so that the mass will adhere just enough to admit of being sliced down with a thin paddle without tumbling over; this will be damp enough to prevent their blowing away before light airs, but not damp enough to stick in lumps. (All this work with the ashes as well as the subsequent sowing should be done with buckskin gloves on; otherwise the damp ashes will cause ugly sores on the hands.) Now add the seed at the rate of one tablespoonful—taken up as full as the seed will rest on the spoon—to each quart of the ashes. Mix the seed thoroughly throughout the mass, and, to see that the mixing is thorough, pat smooth one or two square inches in different parts of the mass, and see that the number of seeds thereby rendered visible is about equal in each. This affords the only guarantee that the plants will come evenly in the beds, when they may be expected to develop with the desired uniformity. Finally, run the mixture through the sieve, which assists the uniformity of the distribution. Two ounces of seed, containing twelve tablespoonfuls, will sow three of the one-hundred-foot beds; that is, each bed requires four tablespoonfuls, or two thirds of an ounce. Tobacco seeds are so minute as to be quite invisible when scattered on the ground, and therefore this mixture of them with ashes is needful in order that the sower may be able to see what he is doing, and get them evenly distributed over the bed.

Prepare also a light roller, the handles of three by one and one half inch stuff, about six feet long; the roller itself to be six to eight inches in diameter, and two feet long.

When ready to sow, shape out of a shingle a paddle about four inches broad. Convey the box of ashes and seed, prepared as above, to the beds, along with a tin pan of convenient size—say about that of an ordinary milkpan. Smooth the ashes to an even depth over the bottom of the box, and measure it to see that it is even. Then with the paddle mark off the surface into equal rectangles, each say ten to twelve inches on a side. Each rectangle will thus become the surface of a rectangular solid of ashes (which we will call a cube), four inches deep; and each cube thus indicated will contain six to eight quarts. It is supposed that the quantity of seed contained in each will also be equal. Knowing the total quantity of seed put into the box, and the number of cubes marked off, the amount of seed in each is also known. The next step, therefore, is to mark off on the beds the space that one of these cubes will sow at the rate above allowed—viz: four tablespoonfuls to each hundred-foot bed. With the paddle transfer one of the cubes to the tin pan, trimming down evenly the sides of the mass whence it was taken. Mix it well again in the pan, to insure the seed being distributed uniformly over every part of the bed. Before beginning to sow, mark off the north line of the bed. Now scatter the ashes very lightly over the bed, going up on one side and down on the other—so lightly as to make the round of the bed three times before the supply is used up. All this pains is needed even by a practiced hand to get the seed sown uniformly. Sow well up to the north line (marked); thus you will sow something over the south line, which is allowed for in the above apportionment of

seed. When sown, the ashes ought to present the appearance of a light snowfall, and not look patchy and blotchy.

Next roll thoroughly with the roller already described, allowing it to rest on the bed and act by its own weight only, not pressing it. In this operation, if the roller be passed either lengthwise of the bed or directly across it, it will shape the surface into slight undulations or form depressions or runnels to which water will tend or accumulate; the roller should be worked along the bed so as to make a set of zigzag curves from one end of it to the other. The earth must be dry enough not to adhere to the roller; sowing should only be done when it is in this condition. Rolling is really the test of proper condition. Nor can sowing be done properly when there is any wind. If winds be persistent, the early morning before they rise, and the evening after they have ceased, can be availed of. Should a portion of the mixed ashes and seed be left over to be sown at a subsequent time, they must be again dampened and again run through the sieve, for this time they are bound to be lumpy.

If these operations be all performed as directed, the product ought to be a set of plant-beds that may be confidently looked to to yield in due season an abundant supply of thrifty plants, coming on well together.

WATERING.

After the surface of these beds shall be once wetted, whether by rain or by watering, it must not be allowed to become again dry till the young plants are fairly advanced. It must be clearly understood that a single drying out to the depth of an inch or even less will be fatal to a large part of the sowing. The watering is of course most easily done with a hose and force pump, but where the amount of beds does not exceed six hundred yards—say for a crop of forty acres or thereabouts—one man can water them with a good sized, ordinary garden watering pot, provided he have but a few yards to carry the water. The water is to be thrown on the top of the covers, through the sheer material of which it is discharged as a fine spray on the surface of the bed. The force pump ejects its stream with the proper force for this purpose. Where a water pot is used it should be held as high as a man's shoulder, in order that the water may fall on the cover with sufficient force to go through it to the bed at the point of impact, instead of flowing down on the under side of the cover to its lower edge. Ten gallons of water applied daily to each cover will be ample.

WEEDING.

In from two weeks to four weeks after watering begins—the length of time depending on the character of the season—the young plants may be looked for. They appear with two tiny leaves, not larger than the smallest pin's head. Before they become discoverable, weeds will begin to show more or less abundantly. These, however, can commonly be left till the young tobacco plants can be discovered quite thickly. Then begin weeding. About twelve hours in advance of weeding wet down thoroughly the beds that are to be weeded. Remove a cover and lay a piece of board across the bed, one end resting on the back board of the bed, the other on that of the next parallel bed. On the board a man can recline and draw the weeds rapidly and thoroughly, moving the board forward as his work progresses. In this work, care must be taken not to disturb the ground. Where a weed appears deep-rooted, subject

it to a light, steady strain, first in one direction then in another, not breaking its stalk--and it will come away. If the earth around it offers to break up, hold it down with the fingers of the other hand while the weed is being drawn out. A bed well weeded ought to show no other sign of the operation than a number of little clean round holes. Replace each cover as fast as its bed is weeded. After weeding, wet the beds well down again to settle the earth promptly. Thus proceeding, two men can properly tend say six hundred yards of beds, including watering them.

BRINGING ON PLANTS.

It may be desired to hasten the maturing of the plants in a portion of the beds, or in the whole of them. When the plants appear to be making a generally healthy growth, the beds being well filled with plants having four leaves each, and it is merely desired to harden them to the stage fit for transplanting, withhold the water for a few days, till the plants show slight signs of suffering for it, the green of their leaves looking wan and faintish. Then water copiously, and withhold again. By the second day following this watering, a good many of the plants, and perhaps a sufficiency, will be found to have attained the desired condition. It may, however, be necessary to repeat the operation. By this means, a set of really thrifty beds, which had attained to the stage of forwardness contemplated, ought, within a week from first withholding of the water, to be in condition for the beginning of general transplanting. The leaves of the young plants should show a deep green color and a general look of maturity quite distinct from the tender emerald green of the younger plants; the stalk should have exchanged its soft, cellular, watery, translucent appearance, for a firm, opaque one. The specific effect of this treatment is to cause the roots to push out and down in search of the receded moisture while it is withheld, and to take up food freely and abundantly as soon as it is again supplied.

Should the plants fail to respond promptly to this treatment, or should they have failed within ten to twelve weeks at furthest after first making their appearance to have developed at least four well-grown leaves, it may be suspected that there is something wrong with the beds. Some difference in the rate of growth is to be looked for, according to the character of the season, the coldness of the weather, the warmth of the soil, etc. Too abundant watering may have contributed to keep the ground cold and retard growth. But after making proper allowance for all these things, the plants may have failed to come forward as they ought. It must then be inferred that the food needful for them is not within reach of the rootlets, and they must be stimulated. Liquid ammonia added to the water will bring them forward, if anything will; but a strong solution of chicken manure or pigeon manure will commonly be sufficient for the purpose and more convenient. Dump the manure into the tank or reservoir in which the water for the plant beds is maintained, and water the beds frequently—moderating the quantity given at one watering; that is, give the soil a chance to get warmed—taking care that it does not become dry. Sometimes after the first stimulus administered in this way the plants will grow freely with the ordinary watering. This shows that only the surface layer of the beds was deficient, from some cause, in plant food. At other times it may be found needful to continue the use of the liquid manure throughout the planting season. It was to obviate the chance of this set-back that in forming the plant beds the soil was worked for

a depth of only about three inches from the surface. That superficial layer will rarely fail to contain sufficient food for the young plants, even should there be a comparatively barren subsoil below, which we have intended not to disturb.

SPROUTING SEED.

When it is desired to bring plants forward quickly from the time of sowing, the seed for that purpose may be sprouted. To do this, sift into a suitable vessel (say a tin pan with holes in the bottom) rotten wood to a bulk two or three times that of the amount of seed to be sprouted. Moisten with milk-warm water, and place where the temperature can be maintained at about seventy degrees Fahrenheit. When the weather serves, expose to the sun. The mass should not be allowed to dry, nor the lower portion to be much wetter than the upper. Warm water to maintain the proper moisture should be added several times in each twenty-four hours. If a few drops of ammonia be added to it, the sprouting is likely to take place sooner, and, some people believe, the subsequent development of the young plant to proceed more rapidly. After the tenth day, examine the seeds daily with a magnifying glass, and when the brown hulls begin to crack, disclosing the white kernel, germination has begun and the seed is fit to sow. This ought to be in from ten to twenty days after wetting. To sow, mix with ashes, and proceed as before described.

Seed to be sown later than January ought to be first sprouted, unless the ground be likely to freeze; and it should be well to take some chances on this point; and if a killing freeze do come, the beds can be sown over again. Sprouting may also be resorted to, to test the vitality of seed. Another test is to throw a pinch of seed on a hot stove, when, if they be sound, they should pop with a crepitating noise. A third test is to put a pinch of seed in the palm of one hand, and rub vigorously with the thumb of the other; all imperfect seeds will reduce to an impalpable powder and disappear; those that remain are sound, though they may have lost vitality. If a parcel of seed should fail under these tests to exhibit vitality, it had better be rejected.

FLEAS.

During a period of not more than forty-eight hours—that is, from the day following its first emergence from the soil to the end of the second day following that, the young plant is liable to destruction from a minute flea, itself scarcely larger than a tobacco seed—which will appear in the beds in such dense swarms that the surface of the ground seems literally "alive." Within twenty-four hours they may sweep away an entire growth of young plants within the ages specified. After they are three days old, the plants appear to be proof against—or safe from—the attack of this enemy. He is apt to make his appearance on a warm windless day—such as are always liable to occur at the season of the year when tobacco plants are sprouting. I am not aware that the flea has ever been detected, in California, on a cold or blustering day. He is easily destroyed by dust of dry tobacco, which is to be sprinkled freely upon the beds as soon as the flea is detected.

As the dust falls, the surface of the bed seems to rise to meet it as myriads of the little creatures leap into the air, but they fall back and are heard from no more. Thus easily extinguished, they need not be

dreaded, provided sufficient watchfulness is maintained to detect their first appearance. The plants encounter no other serious enemy while in the beds. The total cost of making and tending seed beds (exclusive of cost of covers, but inclusive of that of seed,) may be about two dollars and twenty-five cents for each acre to be planted. One proposition ought never to be lost sight of: that too much care cannot be expended on the preparation and maintenance of your beds, and whatever money cost is judiciously laid in this direction is a true economy. Healthy plants and a plenty of them are the basis on which the whole enterprise rests.

TOBACCO YIELD IN CALIFORNIA IN EIGHTEEN HUNDRED AND SEVENTY-FOUR.

From the best obtainable information we are enabled to present the following statement of the yield of the tobacco crop in eighteen hundred and seventy-four: Alameda County, one hundred thousand pounds; Lake, sixty thousand pounds; Los Angeles, one hundred thousand pounds; Santa Barbara, seventy thousand pounds; Santa Clara (includes San Benito), eight hundred thousand pounds; Santa Cruz, seventy thousand pounds; San Mateo, forty thousand pounds. Total, one million two hundred and forty thousand pounds.

QUICKSILVER.

QUICKSILVER.

A POPULAR DESCRIPTION OF THE METAL, ITS EXTRACTION FROM ORES, AND ITS USES.

BY DR. G. F. BECKER.

There can be no doubt that the most prominent characteristic of quicksilver is its fluidity at the ordinary temperatures of the atmosphere. This is, indeed, so striking a peculiarity that, except to a mind somewhat used to generalizing, mercury seems almost a substance apart, and not, in the ordinary sense, one of the metals. A moment's reflection, however, shows that there is nothing generically peculiar about quicksilver. The relation between the prevailing temperature of the surface of the globe and the melting point of the metals is an accidental and probably a temporary one; there is much less difference between the melting point of mercury and that of lead than between the temperatures at which lead and copper become fluid. The globe has certainly once had a temperature at which all these metals were permanently liquid, and a reduction of a hundred degrees more would familiarize us with a soft, ductile metal, much resembling lead, though with a tin-white color, for which the name of quicksilver would be a misnomer.

THE USES TO WHICH WE PUT MERCURY

Depend to a great extent upon its fluidity under ordinary conditions; gold, for example, would be even better than mercury for barometers were it only liquid. It is frequently a matter of great convenience to be able to bring water in contact with melted metal, and, with the exception of an alloy or two which melt just below the boiling point of water, mercury is, of course, the only metallic body available in such cases. I tried in my last lecture to bring into especial prominence the similarity of the action of quicksilver in the amalgamation process with that of other metals in a fluid state, and showed that the main difference is in the replacement of the melted slag of the furnace by a watery

emulsion of the rock in the barrel or pan. A vast proportion of the mercury yearly produced is employed in amalgamation; most of the remainder is consumed in the manufacture of vermilion paint and mercurial drugs.

Quicksilver sometimes occurs native in connection with its ores; but generally in inconsiderable quantities. It is also sometimes an ingredient of a complicated mineral called tetrahedrite, but by far the most important ore of mercury is the sulphide called cinnabar, and identical in composition with the vermilion of commerce. The largest deposit of this ore is at Almadus, in Spain. The Almaden mine has been worked since seven hundred B. C., and is scarcely even well developed yet. The second largest deposit is at New Almaden, in this State; but, as thus far known, it does not approach the Spanish deposit in value.

Quicksilver belongs to the same general group of metals as gold and silver, and like them, its affinities are weak—its components are readily decomposed. The beneficiation of cinnabar depends on the fact that sulphur unites with much more strength with most other substances than it does with mercury. If cinnabar be heated with lime, the sulphur of the ore combines with it, forming sulphide and sulphate of lime, and having metallic mercury. If we heat cinnabar in a current of air, the mineral is also decomposed; the sulphur unites with the oxygen of the air to sulphurous acid, the unpleasant smelling gas we have met so often in these lectures, and metallic mercury is again left behind. If we form an illustrative diagram of these changes we get:

Mercuric sulphide—Quicksilver.
Mercury—Sulphide of lime, and gypsum.
Mercuric sulphide—Oxygen.
Mercury—Sulphurous acid.

Perhaps you may remember that when sulphur of lead, or galena, is heated in a current of air, the oxygen attacks both constituents of the mineral, and we get, as here, sulphurous acid, but in place of metallic quicksilver oxide of lead results. Gold, silver, platinum, and mercury, the noble metals, are not attacked to any extent by free oxygen, and hence, in the present case, metallic mercury is produced by simple roasting.

QUICKSILVER POSSESSES A PROPERTY

Which greatly simplifies the operations subsequent to its isolation in a metallic form. It is highly volatile, and boils at a temperature of six hundred and seventy-five degrees. It, therefore, distils off from the ore during the roasting, and only requires to be conducted through proper condensing apparatus to be liquified, and obtained in a marketable shape. If gold and silver were only volatile at furnace temperatures, we could beneficiate their ores in the same way—*i. e.*, sufficiently volatile; for, though we cannot distil these metals in any ordinary furnace, very small amounts of gold and silver do pass off as vapor, when they are melted, and their volatility is, consequently, great enough to necessitate troublesome precautions, and to occasion loss, though it is insufficient to be turned to practical account.

Retorting quicksilver ores with lime is a method of beneficiating them, now seldom practiced, except for assay. When used, this method differs but little from the retorting of amalgam, which I described in my last lecture. The retort is filled with a mixture of cinnabar and lime, and heated. The mercurial vapor passes out of the retort through tubes, cooled with water, and the liquid quicksilver drops from the end

of the tube. The retorts are sometimes made so that they can be changed from the outside of the furnace, and thus be kept at work continuously. A larger percentage of the metal is obtained than by the process of roasting; but the cost of apparatus, labor, and extra fuel, more than compensate for the gain, under ordinary conditions.

THE OLDEST CINNABAR ROASTING FURNACE

Still, or until recently, in use, is the Bustamenti furnace. In this apparatus the ore and fuel are charged together in a short vertical shaft, and air is admitted from below and from the side. When the shaft is incandescent, the air decomposes the cinnabar, and the volatile products, sulphurous acid, mercurial vapor, and carbonic acid, pass off through flues into two large, square chambers, where the gases are somewhat cooled. At some distance there is a second pair of chambers, and the two sets are connected by several tubes. These tubes are formed of short joints, and each joint is an earthen vessel swelling at the middle, and with one end larger than the other, so that the small end of one "aludel," as these vessels are called, may be thrust into the large end of the next. The point is made with clay. These composite tubes slope from each end toward the center, and rest on a foundation of masonry. The mercurial vapors passing through these tubes are cooled down and the metal deposited in drops, which, on account of the inclined position of the tubes, run down to the central point. A small hole in the under side of the aludel occupying that position, allows the metal to escape and collect in vessels set to receive it. So much of the vapor as escapes condensation in the aludels, passes into the second set of chambers, where another portion is liquified, and the remainder passes out into the air and is lost.

Besides the metallic quicksilver, another product is condensed, called soot. Its composition varies, but it contains flour of mercury, *i. e.*, quicksilver, in minute globules; undecomposed sulphur of mercury, for cinnabar is itself volatile, and, when air is not brought in contact with it, may be distilled unaltered; calomel, when there has been any salt in the ore, and soot proper, formed by the imperfect combustion of the fuel. This product is collected and worked over by hand with lye, to cleanse the minute globules of the metal from impurities, whereupon a large portion of them unite to drops and are thus recovered. The remaining matter is added to the ore at the next charge.

The mixing of fuel and ore, as practiced in this furnace, has one great disadvantage. If at any time there is more fuel than there should be, too great a heat is produced, and if there are easily fusible compounds in the ore, such as silicite of iron, a glaze is produced, which in this, as in all roasting, interferes very much with the proper action of the air upon the ore.

THE ALUDELS,

Too, are somewhat difficult of manipulation, and it is very hard to make the joints between them tight, and no one would now build a furnace on this plan.

The New Almaden furnace consists, in the first place, of a large square shaft, two opposite sides of which are broken through with numerous openings. This shaft is filled with lumps of ore so arranged as to leave passages through the mass, but no fuel is mixed with it. The fireplace is placed on the outside of one of the perforated walls; the flame

strikes through the perforations into the ore and the gaseous products of the process pass through the opposite wall into a series of condensers. The condensers are large chambers of brick, wood, iron or glass, in which there are cross-walls, and these cross-walls are broken through alternately at the bottom and the top, to admit of the passage of the vapor, but at the same time to compel it to take a circuitous course. This at once lengthens the distance over which it must pass, giving it time to cool, and, by producing gentle eddies in the current, favors the fall of minute particles of solid or liquid matter. The floors of the chambers are curved and slope towards the outside wall, so that the metal, as it liquifies, may collect at one point in each chamber, whence it may either be allowed to run out continually through a small opening, or may be tapped when it has accumulated. As the vapor must be cooled down as far as praeticable, the natural draft is very slight, and a tall chimney, generally with a small fire in it, is needful to draw in the requisite amount of air through the grate.

The working is very simple; the fire is gradually increased from the start, until, after from three to four days, the mass of ore has come to a moderately bright red heat, plenty of air being admitted all the time. When this point has been reached, the distillation is considered complete, and the furnace is closed up and allowed to cool. As soon as it is cold, the exhausted ore is removed through suitable openings and the furnace is recharged.

OTHER DIFFICULTIES.

The necessity of allowing the furnaces I have mentioned to cool down before recharging, involves great loss of time and fuel. The first furnace devised to allow of a continuous working was the Haehner furnace. In this the ore and fuel are charged together into a shaft, the bottom of which consists of a grate with movable bars. By moving one or more of these bars, the lumps of exhausted ore can be allowed to drop from the furnace, while fresh material is added at the top. The condensation chambers are arranged as in the Almaden furnace. The continuity of the Haehner furnace is a great advantage, but not the mixing of fuel and ore. It has consequently been modified so as to resemble furnaces long in use for ores of other metals, by allowing the flame from one or more outlying fireplaces to strike into the shaft filled with ore alone. An important advantage is gained, as in the exceedingly similar Swedish furnace, by placing the openings for the entrance of the flame some distance from the bottom of the shaft, and allowing the air for roasting to enter at the opening intended for withdrawing exhausted ore. In this way the air is heated by the hot worthless material, and the heat thus returned to the upper portion of the furnace.

The "Knox & Osborne" furnace of California, and the latest furnace of the works at Idria, Southern Austria, correspond to this general description. The former is provided with a single fire, which draws straight across the column of ore in the shaft, and is built of heavy brick walls. The Idria furnace, of which a copy is now putting up at New Almaden, is provided with three fireplaces, which draw through nearly three quarters of the height of the column, the gases passing out at two openings close to the top of the furnace. The walls are of a construction first adopted in England for iron-blast furnaces, and since applied with great success to a variety of other furnaces—a comparatively thin lining of fire-brick, surrounded by an annular space filled with air, answers admirably as a non-conductor of heat, outside of which is another thin

wall of brick, inclosed in a shell of boiler-iron. The charging apparatus is also borrowed from blast furnace construction, and is of the kind called Parry's bell and hopper. The mouth of a conical hopper is closed by drawing up into it an upright suspended cone. When the hopper is filled the cone is lowered, and the ore enters the furnace, but its fall is broken by the presence of the cone, and it is thus necessarily distributed in all directions in the furnace. The cone is instantly raised again, and thus shuts off the escape of gas.

THE CONDENSER

Of a quicksilver roasting furnace forms, of course, an exceedingly important portion of the structure, and no absolutely satisfactory construction has thus far been hit upon. Brick is an exceedingly porous material, and quicksilver both filters through it and is absorbed into it by the almost resistless force of capillary attraction. Some years ago, in pulling down an old furnace at New Almaden, it was found that the metal had penetrated the foundation and the earth for over thirty feet, and down to the bed-rock. Since then the furnaces have been built on arches, and in the pillars, on which the arches rest, sheet iron plates have been placed to intercept the metal in its downward course; much metal, however, undoubtedly penetrates the outer walls of the condenser, and is evaporated from the surface, for mercury evaporates, more or less, at all temperatures above the freezing point of water, and the condensers, though built of a very considerable thickness, are, of course, somewhat warm on the outside. On the other hand, the thicker the condensers, the less does the vapor inside cool; and, as it must cool to condense, the necessity for thick walls renders a large number of condensing chambers indispensable. It is natural, therefore, to seek some material better adapted to the work required than brick. Cast iron and wrought iron answer very well for condensers, so long as the gas is hot, but when the temperature falls below the boiling point of water, a very disagreeable action sets in. Sulphurous acid, heated with air in contact with highly porous substances, is partially converted into sulphuric acid; this condenses with the water and attacks and soon destroys the iron. Wood withstands this action tolerably well, and does not let quicksilver through like brick, and it has, consequently, been much used for the later condensers of the series; but wood is a non-conductor of heat, and hence, properly speaking, ill adapted for cooling apparatus. At New Almaden glass is found to answer excellently, being a much better conductor of heat than wood, though not so good a one as iron, and being, of course, quite unaffected by the acid liquors. The condensers assume a great variety of forms, such as chambers of various shapes and tubes. Columns of coke are also used with some success as a final conductor. The draught is sometimes kept up by the aid of a chimney, with or without the help of a fire, to give the air in the stack additional buoyancy, and sometimes by a suction fan, or a "water drum," an apparatus which sucks in air by means of the friction of a jet of water. So far as the condensation is concerned, an artificial blast would be preferable, but the danger of blowing jets of the metallic vapor through fine cracks in the apparatus, would be too great to admit of its employment.

THE LOSSES IN QUICKSILVER SMELTING

Are various and very important, though they are not all very well

understood. The whole bulk of gas passing out of the last condenser is saturated with mercurial vapor. The amount of metal contained in this vapor depends on the temperature, and for low temperatures is very small per cubic foot, but its aggregate amount per day is by no means inconsiderable. Another source of loss is the fine dust of mercury suspended in the gas, minute globules, so small that they fall very slowly through the air, and are, therefore, carried away in the current of gas. The rate at which a spherical body falls through the air depends upon its specific gravity and its size, and we have, therefore, only to make a globule small enough to give it a permanent velocity of ten feet, or of one foot, per second. As the mercurial vapor is cooled in the condensers, the mercury is separated out like mist, and the individual globules, which are too small to fall rapidly, and which do not collide and aggregate with others, are, to a great extent, carried off as a dust. Nothing is more difficult than to filter very fine dust effectually on a large scale from a current of gas, as has been proved over and over again in the attempts made to catch the fume from silver smelting furnaces. How much such fume is formed in quicksilver smelting must depend on various circumstances, but the formation of soot in the conducters is sure to be accompanied by a loss in this way, for the metal which is separated out at the same time as the soot will, to some extent, be coated by non-metallic impurities, and rendered incapable of running together into larger drops.

The metallic mercury obtained from the conducters rarely needs any refining. Dirt mixed with it is readily extracted by filtering through cloth or leather, and it is then simply weighed out, and bottled up in wrought iron flasks ready for market.

The metallurgy of quicksilver is thus, as you perceive, comparatively simple, consisting essentially of but a single, and by no means complicated, process. The working of quicksilver ores is unquestionably susceptible of great improvements, but it is only lately that a sufficient number of cinnabar mines have been known to give employment to more than an exceedingly small number of technologists. In the future emulation and competition will probably produce rapid advances. I shall finisnh the hour with a few remarks on

FUEL.

Mr. Beeker occupied the second half of the hour with remarks on fuel, in which he took occasion to point out the causes of and the remedy for the ignition of coal cargoes, and laid especial stress on the great advances made on technology in the introduction of gas, made from inferior fuels, or even from wet sawdust, for producing temperatures hitherto unattainable.

BEET SUGAR.

BEET SUGAR.

Since the close of our civil war the cultivation of the sugar-cane and the manufacture of sugar therefrom has nearly ceased to be an industry of our country. Nearly all the sugar now produced is from the maple, which is limited in quantity. The attempt to separate and crystallize the sugar of the sorghum cane on a large scale has been wholly unsuccessful, and as a saccharifierous plant it is only valuable for the manufacture of molasses.

In view of these considerations, and also that neither the Southern States nor Cuba have resumed the production of sugar, the manufacture of this article from beets must become a national industry. It has already excited considerable attention in the United States during the last ten years. The discovery that sugar can be produced from the beet at less cost than from the cane, was made in seventeen hundred and forty-seven, by a German chemist, but it was only in seventeen hundred and ninety-six, after many trials, that several factories came into successful operation.

The first manufactory of beet sugar on a large scale was in successful operation in Silesia (Germany) in eighteen hundred and five. Owing to the disturbed state of Europe at that period, no further progress was made until eighteen hundred and twelve, when the First Napoleon enforced this industry in France, where it was demonstrated that its manufacture could be profitably conducted on a large scale. His object in introducing the beet into France was to exclude sugar grown in the British Colonies from his Empire. Stimulated by its success in France, the beet sugar interest was revived in Germany, and as early as eighteen hundred and thirty-six, there were one hundred and twenty-two factories in operation.

On January first, eighteen hundred and sixty-eight, there were reported three thousand one hundred and seventy-three refineries in operation in Europe, several of which deserve particular notice.

The factory at Waghausel is of enormous proportions — it covers twelve acres of ground, and employs three thousand hands.

The little State of Brunswick (about the size and population of San Francisco County), alone, has twenty-five factories, which produced in the fiscal year eighteen hundred and seventy–seventy-one, over forty-six million pounds of sugar (twenty-one million kilos), valued at five million Prussian thalers (about three million two hundred and fifty thousand dollars.) Two hundred and fifty-five million kilos of beets were consumed in the production of this amount of sugar.

The process of manufacturing sugar from the beet has been brought to a high degree of perfection, but without Government support and encouragement at the outset it would not now be numbered among the industries which bless the world.

The French Government offered a prize of one million francs for the most successful method of obtaining a supply of indigenous sugar. It was soon proved that the supply could only be furnished from the beet root. In Poland, as early as eighteen hundred and twelve, Government loans and exemption from conscription were offered in aid of the enterprise. In fact, the principal Governments of the continent of Europe vied with each other in perfecting and extending the new enterprise.

Our own Government has, during the past ten years, thoroughly investigated the beet sugar interest, as can be seen in the various agricultural and commercial reports. Since eighteen hundred and sixty-six it has removed all the duties on sugar machinery imported from Germany (where the machinery for this process has been brought to the highest degree of perfection), and protected the manufacture of sugar from beets by a tariff of from two to four cents per pound; whereas, the various European Governments exact a revenue of nearly an equal amount from this manufacture.

Further: at the Exposition of Paris in eighteen hundred and sixty-seven, the great danger to our agricultural interest was shown, and has since been plainly verified; and, referring to this, the President, in his message in eighteen hundred and seventy-one, uttered the following words of warning to agriculturists:

"The beet sugar interest opened to our view a field until lately untried by the American agriculturist, in which other countries have met with most distinguished success, as may be illustrated by reference to the history of this single product."

It may be interesting as a fact illustrative of the cheapness with which beet sugar is produced in France, to note that though England is so well supplied with Colonial grown sugar, she nevertheless imports annually a considerable quantity of beet sugar from France.

It is also a well known fact that the expense of the late Franco-German war were in both countries, in a great measure, defrayed by the taxes on beet sugar—so large and so important is that branch of industry.

The declared value of various forms of foreign sugars, which, in the year eighteen hundred and seventy, were consumed in the United States, was nearly seventy-two million dollars, being little less than the value of the total domestic export during that year of wheat, flour, and all other kinds of grain products.

Counting commissions, freights, etc., sugar costs the country many dollars more than was realized from its foreign trade in breadstuffs.

In eighteen hundred and seventy-two, the entire export of breadstuffs amounted to ninety-three million dollars, and the import of sugars from all quarters amounted to the enormous sum of one hundred and three million dollars.

In an agricultural point of view, it would be of great advantage to divert a considerable portion of the lands and labor given to wheat culture to the growth of sugar beets. The agricultural interest of California has now been proved so much more important than the mining, or any other interests, that our farmers are now rapidly becoming both practical and scientific, and from both standpoints are realizing the necessity of preserving the strength of their lands by alternating other crops with their wheat.

All kinds of products are being tried—cotton, tobacco, ramie, etc.—but with the foregoing figures in view, can it be doubted that the beet-root will pay them better than any of the above?

And that it is necessary for them to grow it is shown by the fact that the table of the principal domestic exports of the Sandwich Islands for the quarter ending September thirtieth, eighteen hundred and seventy-four, prepared by the Collector General of Customs, shows a decrease for the quarter, as compared with the corresponding period of eighteen hundred and seventy-three, of nearly two million pounds of sugar, which must be supplied in some manner.

In eighteen hundred and seventy–seventy-one, the price of refined sugar was on an average seventeen cents per pound in the United States, while in France and Germany it was only ten and one third cents.

Considering that the average consumption per capita is thirty-five pounds per annum, the great disadvantage of present prices to the consumer is evident.

Experience has proved that this industry can be prosecuted with great success in California, where the beet-root can be produced in large quantities, and of exceptional richness.

The manufacture of sugar from the beet will undoubtedly prove not only a scientific, but a commercial success, in this State. The annexed table illustrates the gradual annual increase in importance and extent of this industry in Europe:

COUNTRIES.	1865–66.	1870–71.
	Pounds.	Pounds.
France	274,000,000	295,000,000
Germany	185,700,000	285,000,000
Austria and Hungary	71,150,000	190,000,000
Russia and Poland	80,000,000	135,000,000
Holland, Sweden, and Italy	4,000,000	25,000,000
Belgium	41,000,000	55,000,000

The following table shows the enormous increase in the consumption of sugar and molasses in the United States in ten years:

YEARS.	SUGAR.		MOLASSES.	
	Pounds.	Value.	Gallons.	Value.
1862	557,137,529	$20,357,090	25,157,280	$3,427,813
1863	518,594,861	19,082,017	31,206,986	4,732,378
1864	632,230,247	29,660,076	33,577,230	7,365,064
1865	608,253,289	25,248,299	43,309,003	7,471,467
1866	977,885,449	39,595,677	47,768,348	7,227,351
1870	.....	72,000,000	.....	.....
1871	.....	103,000,000	.....	.....

I am enabled to append the following figures, than which a more striking proof of the absolute necessity of the immediate introduction into this State of this industry, on a large scale, could not be produced:

In the port of San Francisco alone the imports of sugar and molasses for the current year ending the thirtieth of September, reached sixty-five million seven hundred and fifty-seven thousand and fifty-one pounds of sugar, and seventy-four thousand nine hundred and ninety-nine gallons of molasses, on which were collected from one and three fourths cents to four cents per pound import duty.

GENERAL REMARKS.

It is an axiom in political economy that a nation which exports the raw products of the soil, and imports manufactured goods and those necessities of life which it could produce at home, will grow relatively poor.

Nature, however lavish in her gifts, cannot compensate for a lack of industry on the part of the occupants of the soil.

The complaint so frequently made that California does not increase so rapidly in population and wealth as, considering her great natural advantages, she ought, is mainly due to the fact that sufficient attention has not been paid to the establishment of industries which may give employment to those people who have only their hands with which to gain a living.

Among the most neglected and most important of these various industries is the manufacture of sugar from the beet. The millions of acres of reclaimed land in the Sacramento and San Joaquin Valleys, which are at present comparatively unproductive, are destined at no far distant day to supply the United States with this important article, and thus enrich this State at the rate of more than one hundred million dollars per annum.

The repeated growing of wheat has already impoverished our soil in many parts to an alarming extent, as is manifested by the fact that year after year lands produce less and less, both in quantity and quality. This is caused by the soil being deprived of its phosphates, upon which its nutrition depends.

The climate and soil of California is more adapted to sugar making than is the best sugar-producing country in Europe; their cultivation for this purpose is yearly increasing, promising to become a profitable occupation for thousands.

Since the introduction of this industry there have been produced in California:

Years.	Pounds.
In 1870	500,000
In 1871	800,000
In 1872	1,125,000
In 1873	1,500,000

The yield of sugar to the acre of beets averages nearly two thousand five hundred pounds.

The Sacramento Company has this year one thousand two hundred acres in beets, which will yield about sixteen tons to the acre, and produce one thousand six hundred tons of sugar.

The Soquell Company has about one thousand two hundred acres in beets; the cold coast wind, however, interfered with their growth, but we are informed that a fine article of sugar is being produced. Their failures in former years are due to mistakes caused by inexperience.

Simultaneously with the complete success of the two California beet sugar manufactories comes a report announcing the complete triumph of the Illinois company at Freeport. Connected with this result is the significant fact that it has been brought about by the abandonment of everything foreign pertaining to the culture of the beet. American farming implements and energy have been able to deliver beets at two dollars and eighty cents per ton, which is one dollar and twenty cents less than the average cost per ton in France and Germany.

A sugarie of the capacity of one hundred tons of beets per day (twenty-four hours), yielding eight tons of refined sugar, costs for—

Machinery		$75,000
Buildings		20,000
Working capital		25,000
		$120,000

Calculations on one hundred thousand acres.

Twenty thousand tons beets at four dollars per ton	$80,000	
Twenty white men, at seventy-five dollars } Fifty Chinese men, at twenty dollars }	18,000	
Three foremen	3,000	
One Superintendent	3,000	
Bones and lime	7,500	
Wear and tear	7,500	
Fuel	25,000	
Barrels	16,000	
Interest on one hundred and twenty thousand dollars, at one per cent	14,400	
	$174,500	
Twenty thousand tons beets yield		$352,000
Deduct expenses as above		174,500
Net profits		$177,500

Exclusive of refuse for distillery and feed.

NEW BEET SUGARIES.

Among the new beet sugaries in contemplation is one for Grand Island, Sacramento River. George D. Roberts intends erecting works for next year's beet crop. Grand Island is safely reclaimed from flooding, and its soil produces a reliable crop of twenty tons to the acre, in all seasons. The growth of the sugar beet is peculiar on these reclaimed marshes. On ordinary lands much of the beet root shows above ground, and the part thus exposed is rich in salts and poor in sugar. In the soil of our marsh lands the beet grows altogether downward, and shows only its leaves above ground. Accordingly the percentage of sugar is higher. Parties contemplating erecting sugaries are counseled to examine the matter of subsoil growth, and make sure that it has the advantages claimed.—[*Rural Press.*

COST OF IRRIGATION.

COST OF IRRIGATION.

Chapter V of the Commissioners' Report is devoted to a summing up of the matter in the preceding Chapter, and contains the most practical portions of the report. In the first portion the Commissioners discuss the question regarding

THE PROBABLE COST

Of irrigating the great valley of California. On this subject they say:

Before making any estimate of the cost of canals, it is necessary to inquire how much water is required to irrigate an acre of land. It will be readily understood that the quantity will depend upon a number of considerations. In the first place, it will depend upon the character of the soil, whether sandy or clayey; upon the character of the substratum, whether pervious or impervious, and upon the depth and inclination of an impervious stratum. It will depend upon the character of the cultivation. Rice and sugar fields, vegetable gardens, orchards, and meadows require more water than cereals. The present staples of this country are cereals. There is some cotton cultivation, which will probably be extended; and with abundance of water we shall doubtless have a good deal of alfalfa or lucerne grass. Every farmer will have a little orchard, and will raise the vegetables required for home consumption. The evaporation is high in the interior valleys of the State—quite equal to that in Madrid, where it is about thirteen inches in July.

THE AMOUNT OF WATER LOST

By absorption in the bed and banks of the canal is an unknown and variable quantity, depending on the dimensions of the canals and on the character of the soil. In the absence of the exact data upon these points, we may, for the present, adopt the rule laid down by engineers for other countries of similar climate, and estimate the loss of water from these causes at fifteen per cent. The rivers in California generally run full for about seven months. The rains of the Winter increase their discharge, and the melting of the snows keeps it up, so that we may say that the streams from the Sierra Nevada are well supplied with water from December to August. The streams from the Coast Range have no snow reservoirs of much extent, and they are generally dry in Summer. Let us assume that the streams on the east side of the valley are well supplied with water for two hundred days in the year, and to make up

for any over-estimate on this point, let us neglect their flow for the remainder of the year.

AMOUNT OF WATER NECESSARY FOR IRRIGATION.

How much land ought a cubic foot of water, supplied every second for two hundred days, to irrigate? We will make a further supposition that the water is used for fourteen hours out of the twenty-four. Irrigation at night is practiced in other countries, and we may be assured that in seasons of scarcity it will be practiced here, if it shall prove to be necessary to save the crops. In fourteen hours there are fifty thousand and four hundred seconds, and hence, one day's supply at one cubic foot per second, will give us the same number of feet. Deducting fifteen per cent for loss by absorption and evaporation, we shall have remaining forty-two thousand three hundred and forty cubic feet, which number, although a little less, we may take to be the same as the number of square feet in an acre. Hence, one day's supply will put twelve inches of water over an acre, or two inches of water over six acres, and in two hundred days a supply of a cubic foot per second will cover two hundred acres with twelve inches of water. Wheat planted in October or November on Summer-fallowed land, well watered, when the rivers are high, will probably make a good crop without watering, except what it gets from the Winter rains, even when they prove scanty. Wheat planted in January or February will probably need one or two irrigations of three inches each, to make a crop. Wheat or barley planted later, and with irrigating facilities—there seems to be no reason why, in these hot valleys, the sowing time may not be extended to April—will probably ripen with twelve inches of water judiciously applied.

RAINFALL REQUIRED FOR CROPS.

We know that the good crops of wheat are raised without irrigation where there is a rainfall of twelve inches, or even less, which comes at the required times. On the tule or reclaimed lands, barley sowed after wheat harvest has been gathered, comes to maturity. The water required for cotton will probably not exceed that necessary for wheat. Rice cultivation is so unhealthful that its introduction into California will hardly be looked upon with favor. Alfalfa, if cut five times for hay, will require twelve inches of water or more, depending on the nature of the soil; this in addition to the usual rainfall. There is another point to be considered. The whole of the land commanded by the canal will not be irrigated; some of it will be waste or unsuitable for cultivation; some will be fallow, and if we add the areas taken up by the roads, fences, buildings, farm-yards, etc., we ought, according to experience elsewhere, to deduct one fourth at least from the irrigable land. This deduction of one fourth, we assume, will make up for any kind of cultivation, such as gardens, orchards, etc., requiring larger supplies of water. Our opinion is, therefore, that a reasonable allowance for the land commanded by the canals is one cubic foot a second for each two hundred acres. In seasons when there is a great surplus of water, there can be no objection to a more liberal use of it; but it seems to us indispensable that the State should lay down

A GENERAL RULE.

There ought to be an established allotment, which may vary in different districts. The cultivators who come first ought not to be allowed to appropriate more water than they require; because, if they do, those who come after will not be able to procure a fair supply.

There are probably exceptional places where the lower average of rainfall and porosity of the soil may combine to require a larger allotment of water than we have assigned. Such places are about Tulare Lake, on the west side of the valley. There is no cultivation in these portions, and before the occasion may arise to irrigate them, further information will probably be available to enable a proper conclusion to be reached. As the population of the irrigated districts increases, there will be an increased demand for water, and it will probably result that the allowance which is sufficient in this generation may prove entirely inadequate fifty years in the future. When the State makes the survey elsewhere recommended in this report, we will learn both how much water and how much land there is, and will be enabled to proportion the supply to be granted. It may then be a question, in seasons of scarcity, whether a smaller supply of water will be given to the whole land or a larger supply to a portion of it.

IRRIGATION IN FOREIGN COUNTRIES.

There is so much variety on this point in the circumstances of climate, soil, and cultivation, and so much difference in the statements of different authorities, that we cannot derive from the experience of other countries any definite conclusions applicable to our own; but as a matter of interest it will not be amiss to mention the duty of water in other irrigating districts. In North India a cubic foot of water per second irrigates five acres per day. Taking the interval of irrigation at forty days, we have the duty of two hundred acres for one foot a second for cereals. In Granada, a canal from the Geuil irrigates—of wheat, barley, and vines—two hundred and forty acres per cubic foot. In Valencia, where it is very hot, wheat is watered four or five times, giving about two hundred acres per foot. In Elche, where water is very scarce, a cubic foot goes as far as to irrigate one thousand acres. Wheat here, in some years, scarcely requires artificial watering. Rice fields in different parts of the world vary from thirty to sixty and even eighty acres to the cubic foot. In the heavy monsoons of India ninety acres per foot are irrigated. In some of the huertas or gardens in Valencia, only from thirteen to twenty acres per foot are irrigated. Here, however, there are at least

TWO CROPS A YEAR,

And a part is devoted to rice. The grants for six recent canals in Spain, run from seventy acres per foot to two hundred and sixty acres per foot. Assuming then that a cubic foot per second will water two hundred acres of land, we proceed to give some considerations in regard to the probable cost of construction of the canals and their primary ditches. The secondary and tertiary ditches will, it is supposed, be made by the cultivators. They can be made by the farmer in seasons of leisure, and in the general case their cost will hardly be felt. The case will be somewhat different with the cultivator who farms on a large scale, and who

is obliged to hire laborers. It is plain on the slightest consideration, that the cost of a canal will be so dependent on local and special circumstances, that it is impossible to deduce a perfectly satisfactory conclusion from a given or hypothetical case.

The dam, the character of the soil, the quantity of land to be irrigated; the manner in which it is disposed; the relative remoteness, and the resources and population along the line, are all elements which vary from case to case, and either of which may affect the cost by a very considerable percentage.

PROBABLE COST OF CANALS.

Still, it seems essential to know within some limits the probable cost. If a canal is to cost one hundred dollars per acre irrigated, the subject may be dismissed without any further consideration. It is plain that we cannot afford to pay that price. If, on the other hand, canals may be built for five or twice five dollars per acre, it is equally plain that now, or before many years, we shall be able to afford them, and shall have a fair prospect of return from such investment. The value of the estimate which we proceed to give will be understood from what precedes. Let us take the most favorable case that can happen, namely, when the excavation equals the embankment. We assume a canal to carry three hundred and fifteen cubic feet of water per second, having the dimensions given in the figures:

Cubic yards of excavation on main canal, per mile, 13,850, at 30 cents	.....	$4,155
Cubic yards of excavation of primary, per mile	1,173	.....
Cubic yards borrowed, per mile, of primary	3,911	.....
Total number of cubic yards for primary, per mile	5,084	.....
For five miles of primary, 5,084 × 5, 25,420, at 30 cents	.....	7,626
Total cost of canal and primaries, for one mile of canal	.....	$11,781

WHAT ONE MILE OF CANAL WILL IRRIGATE.

Deducting from this fifteen per cent for loss, the water available for irrigation is two hundred and sixty-eight cubic feet, which will irrigate fifty-three thousand six hundred acres. If we suppose the irrigable land to lie on one side of the canal, in a strip five miles wide, and that the ground permits straight parallel primary ditches, spaced one mile apart, it follows, that for each mile of canal there must be five miles of primary ditches, and that the quantity of irrigable land for each mile of canal will be three thousand two hundred acres. Deducting one fourth for land not actually watered, we shall have two thousand four hundred acres of irrigated land for each mile of canal. Let us take a primary ditch of capacity to carry fifty feet of water per second. Allowing for loss, this size will be rather more than sufficient to cover more than the two thousand four hundred acres with three inches of water, in seven

days and seven nights. The canal can fill, at the same time, six of the primary ditches, so that in seven days fourteen thousand four hundred acres can be covered with three inches of water, only six of the primaries being full at a time. And in twenty-six days three inches of water may be put over the whole amount of the land, namely, fifty-three thousand six hundred acres. If the water is used only for fourteen hours for each day, the time necessary to go over all the land with three inches of water will be forty-five days.

Under our hypothesis, in order to irrigate twenty-four hundred acres, we must build one mile of main canal and five miles of primary ditches. Placing the excavation at thirty cents per cubic yard, we find the cost per acre to be about five dollars. The section of the main canal will diminish toward its lower end, but to be on the safe side so far as cost is concerned, we keep it of uniform size.

THE PRICE OF EXCAVATION

May be somewhat in excess of its actual cost, in some places, but inasmuch as in it are included all incidental and contingent expenses, we believe it is not far from correct. We have omitted from this calculation all estimates of the irregularity of the ground, by reason of which the amount of excavation may be considerably increased; all expense due to the fact that generally one or several miles of canal have to be made at its head before the water is high enough relatively to the adjoining land to irrigate it, and we do not include the cost of a dam, which, generally, will be indispensable. Neither do we include the cost of headworks, or of the bridges and sluices, which will be required, or the measures that may be necessary to pass the drainage off the country, into, over, or under the canal. We do not estimate for these points, for the reason that no estimate can be made, the circumstances in no two cases being the same.

TEN DOLLARS PER ACRE TO IRRIGATE THE VALLEYS.

Speaking generally, we are of the opinion that the omitted points will cost as much as the excavation, and hence that the rate per acre just given should be doubled. This brings us to the conclusion that it will cost about ten dollars per acre to irrigate these valleys.

It is, however, to be remarked, that large portions of the eastern side of the San Joaquin Valley are underlaid, two or three feet from the surface, by a hard stratum, which it will be necessary to blast, or if not blasted, the canals must be very shallow. This fact leads us to believe that the cost per acre in these sections will be increased twenty-five to thirty per cent above the estimate already given.

THE IRRIGATION OF THE FOOTHILLS

Will, of course, cost more. Here the problem will be more similar to that presented in other countries. So far as we are able to judge from descriptions given by writers, we are inclined to believe that the physical conditions in these valleys are exceptionally favorable to irrigation. This fact accounts, in a great measure, for the smallness of our estimates, as compared with the actual cost of canals in Spain, for instance, where the price of labor is so much cheaper than it is in California.

A further reason for this difference lies in the character of the con-

structions. The dams, head-works, and sluices of foreign works, are made of masonry, and in the most thorough manner. In California all of these constructions will for many years be of wood. It is cheaper, with the present rates of interest, to build of wood, and to rebuild when the works decay, than to construct, once for all, of masonry.

THE CHEAPEST CANAL

That we find in Spain is that from the Esla, which cost fifteen dollars per acre. The other modern canals in Spain have cost more than twice as much. There are no longer in these old countries any lands which admit of easy irrigation, and on all these lines there is a great deal of heavy work, in excavating, tunneling, aqueducts, and in reveled walls, which the valley works in California will not require.

GENERAL CONCLUSIONS.

The Commissioners conclude their report with the same conclusions which are presented as a summing up of the whole matter. The principal ones not previously mentioned are as follows:

That the experience of other countries appears to prove that no extensive system of irrigation can ever be devised or executed by the farmers themselves, in consequence of the impossibilty of forming proper combinations or associations for that purpose. That, while small enterprises may be undertaken by the farmers in particular cases, it would not be in accordance with the experience of the world, to expect of them the means or inclination to that coöperation which would be necessary to construct irrigating works involving large expenditures. That enterprises of this character, if built at all, must be built by the State or by private capital.

LAND AND WATER SHOULD BE INSEPARABLE.

As a matter of public policy it is desirable that the land and water should be joined together, never to be cut asunder; that the farmers should enjoy in perpetuity the use of the water necessary for the irrigation of their respective lands; that when the land is sold the rights to water shall also be sold with it, and that neither shall be sold separately. That the State and county will be directly benefited by the appreciation of land and by the increase of wealth in their revenues from taxation. That consequently it may be good policy for them to aid such enterprise. That there is this difficulty in the way of the proposition that the lands shall pay for the canals, namely: that in many places, the lands at present are not worth more than five dollars per acre, if so much, and that the irrigation works may cost ten dollars per acre. That whatever aid is given by the State or county, should be extended in a cautious way. That in many parts of the country where irrigation will ultimately best repay expenditure, there are now no people; that the population must be imported, the houses, barns, and equipments of the farms must be created, before returns can follow investment. That for these reasons, we must look for a comparatively slow development of the country.

PRIVATE ENTERPRISE SHOULD BE INVITED.

That, while we believe, as we have already stated, that the best policy

is for farmers to build and own the canals, we also believe that where the farmers are unable to build, and where the State is unable or unwilling to build, it may be, and it probably will be, the best policy to invite the aid of private enterprise. We refer to numerous instances in Spain and Italy, where this system is now in successful operation, in support of our opinion. The private companies undertaking such enterprises should be subjected to certain conditions, some of which are as follows: That, after a stated period, the franchise shall lapse in favor of the State, or of the irrigators; or that, after a certain same period, the State shall have the right to purchase on certain previously-defined conditions. That the price of water shall be fixed by agreement; each party in interest being represented by arbiters; that the State shall have the right to charter an association of irrigators to administer the works, the company merely selling the water and having nothing to do with it after it leaves their channels; the association making all arrangements for its distribution and the collection of the water rates. This latter provision has several advantages. It relieves the company from the arduous duty of discriminating in times of scarcity, and from the endless disputes which attend the distribution of water, and puts the responsibility where it belongs—on the irrigators. It favors each irrigator, for he becomes a member of a company which is strong enough to stand up for its rights in any contest with the capitalists.

NOT AN INVITING FIELD FOR CAPITAL.

That there is no reason to suppose that for a long time capital will look upon this kind of investment with favor. The financial history of most irrigating enterprises in other countries is not favorable, so far as the interests of stockholders are concerned. It may be a question for the State to consider whether it is good policy to offer any inducements in aid of such enterprises. That the relation of the United States to the irrigation of California is, for the most part, indirect; but that in the southern end of the valley, between Visalia and Bakersfield, and south of this town, it is believed that the United States own many thousand acres of land which are capable of irrigation.

THE DUTY OF THE GENERAL GOVERNMENT.

That most of this land cannot be cultivated under existing circumstances. That it has no value except for pasturage during part of the year. That if irrigated its value would be increased manifold; that under these circumstances it may be a question whether the United States ought not in some way to encourage the irrigation of these lands. That when any canals are built the State should establish a system of inspection, by which a proper construction shall be assured. That the quantity of water to be taken from a river at its main stage, for the irrigation of a definite quantity of land, should be fixed by a reasonable rule, so that those who come later shall not find all the water taken up, and so that proper drainage shall be secured. That the water rights of the streams now taken up for mining purposes in the mountains do not conflict with the irrigation of the plains, the water being returned to the natural channels above the points where it will be taken out for irrigation, at least for many years to come.

FRUIT.

ADAPTIVENESS OF FRUITS IN GENERAL.

THE CULTURE OF FRUIT.

SUN-DRIED FRUIT A FAILURE—NO ERROR.

ADAPTIVENESS OF FRUITS IN GENERAL.

BY GEORGE RICH, SACRAMENTO.

California eclipses all other countries for her varied climate, picturesque scenery, adaptation, and combination of varieties of fruits grown in the torrid and temperate zones. Here are propagated the orange, lemon, lime, olive, fig, cherry, pomegranate, peach, apple, pear, plum, grape, and small fruit in general. The first of small fruits that enter our market in Spring, that so large a proportion of our population enjoy, is the delicious and health-giving luxury—

THE STRAWBERRY.

It being classified by the botanists as one of the large families of the *rosaceas*, combining many distinguishing traits of the rose family. Linnæus named it *fragaria*, from the delicious fragrance of its fruit, of which Europe presents three species, Asia one, South America two, and North America six; of the six, Oregon claims one, and California one; out of these has sprung hundreds of varieties that have been brought to a cultivated and improved state by the works of art and nature; of those that California has so plentifully grown, and is found in our market nearly throughout the season, is of the foreign and North America varieties, which have been brought to a perfect system of culture in our State. The locality where so large a proportion is centered is found at few points; still, being cosmopolitan in its nature, its adaptation is general, confined to no particular spot, but can be brought to a higher state of cultivation where the soil and climate combines, that brings it to a greater degree of perfection. At Los Angeles, with its spicy and genial climate, the strawberry comes to perfection, by culture, nearly every month of the year. In the Santa Clara Valley is where the great bulk of strawberries is grown, and by high culture produces two crops a season, lasting nine months of the year; here is where is principally raised the Longworth Prolific, an American variety, which finds their way in the great central market of San Francisco, and distributed in different parts of the State. Sacramento, "the gem of the plains," can count the second, in quantity of numbers, cultivated for market and shipping purposes. The varieties are the Triomph de Gand, Jocunda or Knox

Yoo, Early Scarlet, Nilson, Albany, Baydon Number Thirty, Lennings' White, Colonel Cherry, and many others; but the main variety is the Triomph de Gand, foreign, which is generally conceded the best shipper for its primeness and excellent flavor for transportation; the varieties are principally all hermaphrodites, with perfect flowers, requiring no mixture of sexes to bring them to maturity. The mode of culture, picking, packing, labor, irrigation, way of carriage, quick transportation, markets, are generally known without comment. Further up the line of railroad, the Town of Newcastle produces excellent small fruit; but later in the season. Nevada City is engaged in it to some extent, and as soon as the narrow-gauge rail route is finished, she too can send her fruits off to a better advantage. Salt Lake City also is engaged in the culture of small fruits, as well as many other varieties. Santa Clara has the advantage over all others, by a few weeks, in sending her strawberries early, as they go direct by rail, but Sacramento soon follows and can send fresher berries and a finer variety with a longer distance of carriage; Newcastle has a few hours difference, but still later in the season.

THE RASPBERRY.

The raspberry is not cultivated to such a large extent as the strawberry, and confined to a smaller locality; still, the cultivation is extending of late years, and will soon be scattered over a large area of ground. We find it mainly near the seacoast at Oakland, where it is mainly cultivated. Santa Clara, Sacramento, and Newcastle, propagate them to some extent. The prominent varieties are the Clarke, Falstaff, Red Antwerp and others, as the Horstine, Orange, Philadelphia, Red Amazon; of the blackcaps are Davidson's Thornless, Doolittle, and Mammoth Cluster.

BLACKBERRY.

The blackberry, which is so easily cultivated, has increased to a large ratio of late, reducing the price to a low figure. As the Sacramento climate is warm, they are generally found earlier in market than at many other points, and shipped in the same manner that the strawberry is to different points along the line of the Eastern railroad, and the market at San Francisco, some three weeks earlier than those cultivated in the southern locality. The canners use immense quantities of them, as they are better fruit and find more ready sale than the strawberry. The vines should have a number of prunings through the Summer, and as the crop is picked the old wood should be removed. The varieties are three—the Early Wilson, Kittatinny, and closing with the Lawton—it is well to propagate them all.

Currants are principally raised in Alameda and Santa Clara Counties, of the Cherry and La Versailles varieties.

English gooseberries are found in the market plentifully and of a large fine quality, of the Whitesmith and Houghton variety.

Figs produce from two to three crops a year, of the Black Ischia, Brown Turkey, and California Black.

Quinces of enormous size, of the apple, peach, pear, plum, and prune varieties; they each have their natural locality; some in the valleys, others in the mountain ranges; also may add the cherry, apricot, and nectarine.

Of the vine and its productive quantity California surpasses the world in the quality and enormous clusters. The climate might be compared

to that of Malaga in dryness of the atmosphere during the Summer months. There winds blowing from the ocean, at times stimulate the effect of vegetation—storms do not occur in the Summer months until some time in August, when they fall heavy, bursting the grapes open, and are difficult to dry. The same effect, in our State, was experienced last Fall, when tons were lost in the vine and many partially dried. They prune in December; plant in January; fruit flower in April, and ripen in August.

The subject of curing raisins is drawing the attention of the culturist, and acquiring considerable discussion, whether raisins can be cured wholly by the fruit dryers. It will be fully tested this year. Many are of the opinion that both art and nature are requisite to perfect them. Fruit dryers are making a large inroad in our State; some fifteen or more were in operation last year, of the Alden process—saving thousands of dollars of fruit that would have perished had they not been in operation. The future looks bright, and California may be proud of her productive soil as well as her golden mines.

THE CULTURE OF FRUIT.

REPORT ON HORTICULTURE FROM CALIFORNIA TO THE AMERICAN POMOLOGICAL SOCIETY.

We take the following ably written report, by Dr. J. S. Strentzell, from the *California Horticulturist:*

Twenty years only have elapsed since the culture of fruit in California has been earnestly engaged in. The liberal recompense realized by the pioneers stimulated others in their efforts to excel. Money and toil were lavishly spent to obtain the best and rarest seeds, and the choice fruits of Eastern nurseries, transplanted here, found a congenial soil and a climate most favorable for their development. Consequently our best orchards and vineyards are overcrowded with varieties, and the owners are forced, by the demands of their markets, to discard even good ones, if not embraced within popular favor.

As one of the most important labors of the American Pomological Society is to perfect a list of the best varieties of fruits adapted to the greatest extent of country and most profitable culture, your committee will be governed by the same action, and restrict itself to that consideration, as regards California.

Conditions predicated upon mean temperature, rainfall, component constituents of the soil, aspect, altitude, an atmosphere more or less infused with moisture, and other meteorological conditions, exercise the same influence here, and are so favorably arranged for fruit culture, that, upon any given spot in California, a greater variety of fruits can be well grown than under a corresponding latitude on the eastern side of the continent; thus, all the semi-tropical fruits can be raised in conjunction with those of the northern clime. Our Astrachans, Baldwins, and Pippins will be recognized as such wherever shown; but, if disguised, it is only by their Sunday clothing, more gorgeous with the tints of the unclouded solar rays; and fed upon the doubly-distilled moisture, derived mainly by condensation, they are sweeter and richer. Besides, judicious irrigation can easily modify any deficiency of juiciness, and protract the season of their ripening. By the time another decade of national life is absorbed, the wastage of water will be economized and retained for the sustenance of plant life during the season of drought. Human knowledge can hardly predict the modifications and the perfection fruit culture will ultimately attain by those efforts; but in California will be the throne of Pomona's most exalted realm; the hills clothed with the vine, every nook covered with fruit-bearing trees, mulberry groves skirting the plain, oranges, date palms, olives, and figs, along the grand irrigating ditches of the San Joaquin, will proclaim her dominion.

A fortune will reward the originator of a first-class early apple. The Harvest, now heading the list, is only of second quality, and the

gorgeously arrayed Astrachan still lower in our estimation. The early strawberry is in every way excellent, but ripening late. For cooking, during the months of June and July, the Dutch Codlin holds its sway. Fall Pippin, Holland Pippin, Gravenstein, Lyscom, Maiden's Blush, Roxbury Russett, do well until late in Autumn. Rhode Island Greening, Baldwin, Swaar, Newtown Pippin, Spitzenberg, and White Winter Pearmain, will fill the list for Winter. Apples keep well all Winter, piled under the trees and sheltered from rain and sun.

A choice selection of pears would be covered by Bloodgood, Bartlett, Washington, Seckel, Winter Nelis, Flemish Beauty. Duchesse and Easter Beurae attain great size, but they are not favorites with the public. Belle Lucrative, Louise Bonne de Jersey, Beurre d'Anjou, Stevens' Genesee, Doyenne, are a drug in the market. Glout Morceau and Vicar are worthless. Experiments in progress with seedling pears are full of interest, and sustain the hope that some of our best varieties can be revivified as seedlings, thus producing a new generation to propagate from. By selecting a variety with large, full seeds, and hybridizing—artificially or by chance—the seedlings thus raised will at once equal, and possibly may excel in some desirable qualities, the parental stock on either side. This will hold good with all other varieties of fruit.

The peach is the most hardy tree grown here; will survive the worst ill-usage, and repay it without diminution of fruit. All it requires is close pruning, shortening-in, and chopping down of the worn-out branches, to sprout from the ground with renewed vigor, and bear another series of superior crops. In wet years the curl prevails, and recently a white fungus attacks the fruit, in blotches, and the ends of the shoots.

A few nectarines are raised, the fruit being inferior in flavor to the peach.

Apricots—the Large Early and the Peach are favorites, and bear profusely, but are often cut short by Spring frosts. Peach stock preferred.

Plums bear abundantly, and, so far, no curculio has appeared. All varieties do best on peach stocks.

Quinces produce regular crops. The largest fruit is grown on the Portugal, attaining the weight of over two pounds. The tree is subject to the black knot.

Cherry trees are very tender; the least bruise of the stem starts the exuding sap, and decay follows. To shade the stem, any way most convenient or practicable, will be found beneficial. A cement of clay and ashes plastered over the stem and thicker branches appears to answer well. Black varieties are preferred here. There are two varieties brought out here under the name of Royal Ann. One is a black, superior to the Black Tartarian; the other a white.

The fig fairly luxuriates under our bright skies. Furnished with sufficient moisture, it produces enormous crops.

Pomegranates thrive well.

The olive is, as yet, little appreciated. Grown easily from cuttings, requiring hardly any pruning, attaining the age of several centuries, and bearing regular crops of olives, as highly prized in the green state as for oil—it will be, by the next generation, more extensively utilized.

Almonds, walnuts, pecans, and chestnuts, the most valuable of nut-bearing trees, come into bearing at an early age; the Japan chestnut fruiting the second year from graft.

Oranges and limes, with more or less protection, grow luxuriantly along and near our line of coast for five hundred miles.

The *Agave Americana*, or century plant, is utilized as a hedge plant.

Currants, blackberries, gooseberries, raspberries, and strawberries, all bear abundantly.

The lordly banana begins to spread its mammoth foliage in many a garden spot.

Thus, under the influence of skilled industry, and the vivifying flow of waters to be utilized, all the semi-tropical fruits will find here a congenial home. But the glory of California will be her vineyards. Innumerable little nooks and valleys, rich with the attributes of surrounding mountains, and under most favorable climatic conditions, are waiting for patient labor to clothe them with the clustering grape. All the finest varieties succeed admirably, and the product—either to be utilized for wine or raisins—is all that could be desired.

It is not to be inferred, nor is it claimed, that the horticulturist in California needs only to plant a tree or a vine to realize, in a few years, several hundred pounds of apples per tree, or even a thousand pounds of grapes to the vine. He has to contend with many evils, as in other climes or avocations; constant vigilance and sound judgment are required to supply the most favorable conditions for the development of his nurslings, and destroy in the beginning their enemies. Different varieties of fungoid growths and injurious insects begin to multiply. All experienced viniculturists pronounce this the most favorite land of the grape; still, oidium is known; the borer, and especially the thrip, do considerable injury. Thus, every laborer in Pomona's realm is interested in the experience of his co-laborers.

A new comer opens a most willing ear to an oft-repeated tale, but full of novelty to him; so, to compare experiences, I take the liberty to make these deductions:

That clean culture is indispensable for orchard and vineyard.

That the raising of other crops between trees, when abundant manures are not obtainable, is a killing of the goose laying golden eggs.

Alkaline or earthy washes of the stem and larger branches are conducive to health of the trees.

By repeatedly scraping off the earth around the trees and vines, early in the Spring, many insects, their eggs and larvæ, are destroyed.

That careful pruning and shortening-in of the shoots is indispensable to the production of fine and large fruits. All the pruning should be carefully husbanded and returned to the soil. To light bonfires for the destruction of insects, to raise smoke to avoid injury from Spring frosts, are probably the most available and serviceable means for destroying fungoid and insect growths on foliage and fruit; by fumigation of the whole orchard and vineyard, making numerous smouldering fires, with the addition of coal-tar, or asphaltum and sulphur.

FRUIT AND VEGETABLE DRYING IN CALIFORNIA.

The success of the Alden process of preserving fruits and vegetables was thoroughly established some time ago, and its importance to our agricultural interests was at once acknowledged. The process consists in removing the water from the vegetable substances, in a few hours, by pneumatic evaporation, and the result is to render articles so treated proof against decay, and while thus artificially ripening them, to increase their nutritious and palatable qualities. Within the last year

extensive improvements have been made in the evaporating apparatus, and its cost has been reduced by more than one half. The new model evaporator is now offered by the Alden Fruit Preserving Company of this city at the price of one thousand dollars. It has all the recent improvements, and while being within the reach of individuals or associations of moderate means, is more convenient, and operated at less expense, than the original apparatus. As regards the buildings necessary to receive the evaporators, their cost in California would be extremely moderate. A common barn, or any ordinary building, can be very cheaply adapted to their reception. The company furnishes, without charge, plans and directions to each purchaser for the erection of new or the alteration of old buildings, and furnish superintendence for the erection of the evaporators. The general and increased introduction of the Alden process in California must lead to results which, in their bearing on our future prosperity, can hardly be over-estimated. Notwithstanding our unequaled advantages of soil and climate, we have hitherto been laboring under great disadvantages in respect to our fruit and vegetable products, in consequence of our distance from a market, and our own sparse population. A few of our productions, such as pears and grapes, have latterly been sent by rail to the East in considerable quantities, but the great cost of transportation and expensive packing render the competition with local markets too unequal. Our own population cannot consume a fraction of the fruits that could be produced, if all the soil suited for that purpose were so cultivated. Hence, great quantities of land in every respect adapted to the cultivation of costly, but perishable articles, is of necessity used for stock-raising and the production of cereals. Could, however, this inequality be overcome, by a process which would render the former imperishable, without diminishing its proportionate market value, the gain to the producers would be enormous.

This result the Alden process can accomplish, for as it opens the markets of the world to our productions, there can be no reduction in price, as our local demand is insignificant. The value of lands is now regulated, other things being equal, by their distance from a market, but this would in a short time be rendered more equal by a method which could in an economic and expeditious manner preserve their entire product. This method would also enhance the profits of fruit culture to a degree difficult to exaggerate, not only by rendering waste of any kind unnecessary, but by the removal of any motive for competition to secure a quick sale in the event of an abundant harvest. When it is considered how much of the products of our orchards and vineyards is now wasted and left to rot ungathered, and how much is at times forced on the market at unremunerative prices, the advantages of a process which will create results as favorable in one direction as the others are disastrous, must appear overwhelming. The wholesome qualities of the fruits and vegetables cured by this process, and their superiority in this respect over the usual canned articles, are well known.

The demand for the Alden products is rapidly on the increase, and must continue to be so for a generation to come, even with the additional supply that labor and capital will produce. The profits that must accrue to the land owner from the general adoption of this process may be gathered from the fact that by it, according to a careful estimate, a thousand dollars worth of apples, peaches, tomatoes, etc., will not only come from one fourth the acres required for one thousand dollars worth of wheat,

but will be contained in one fourth the bulk, and go to any market for one fourth the freight.

The prospect of profit and independence to small land owners, which this invention opens up, ought greatly to increase the attractions of California to the immigrant. The climate and soil of this State are favorable beyond that of any part of the world to the production of the fruits and vegetables suitable to treatment by it. The apparatus is so simple that unskilled labor—that of boys and girls—can be advantageously employed by it. Where an evaporator and the necessary building are beyond the means of a single farmer, an association of a few could command the necessary funds, and the profits would amply repay all concerned from the very commencement of the enterprise

"There are thousands of acres of land in California where all the conditions are favorable for the production, in the greatest abundance and perfection, of the finer varieties of fruits, such as prunes, plums, apricots, and raisin grapes—fruits which cannot be successfully raised east of the Rocky Mountains, and for which there is, and always will be, an unlimited demand; and, to show the profit of the culture of such commercial fruits in connection with the Alden process of preservation, we respectfully submit the following estimate: Take the prune, for example. At fourteen feet apart, two hundred and twenty-two trees may be planted to the acre. The writer has seen trees, of the Petite Pruns d'Agen (an excellent) variety, five years old from the bud, bear two hundred pounds to the tree. These prunes can be made into an article far superior to any imported prunes, at a cost not exceeding three cents per pound. This would give fifteen thousand two hundred pounds to the acre, of preserved prunes, which, at twenty cents per pound, would give three thousand and forty dollars per acre, or about fourteen dollars per tree. Deduct from this the cost of curing, three cents per pound, or four hundred and fifty-six dollars for the product of one acre, and you have two thousand five hundred and eighty dollars net, less the cost of raising. Those who consider these estimates too high may reduce them one half, and still it will leave a handsome return for the labor and capital invested."

At present the United States pays millions of dollars annually to foreign countries for canned fruits and vegetables, to meet wants which, with proper enterprise, we ought to be able to supply ourselves, leaving a large balance for export. With the amount of our national indebtedness abroad in the shape of interest on bonds and railroad securities, every industry which fosters home production and helps to diminish the specie export, is a direct gain to the country—and more especially where it offers such great rewards to those engaged in it as the one which is the subject of our remarks.

SUN-DRIED FRUIT A FAILURE---NO ERROR.

Something over a year ago we published, in the Agricultural Department of the *Record*, the following article on the subject:

"Owing to the peculiarity of our climate—a climate in which fruit may be dried as rapidly and with as little expense as in any other country—the system of drying fruit in the sun is practically a failure. This may strike those who have thought but little on the subject, and who have had no experience, as a strange proposition; but to the practical man, the man who has dried fruit in the sun, and kept the same any length of time before disposing of it, and to the merchant who has been dealing in sun-dried fruits, and had box after box returned to him, it is very plain and easily understood. In whatever country you dry fruit in the sun, exposed to insects, they will deposit more or less eggs upon it. If that country be a cold one, like the Atlantic States, for instance, the cold weather generally sets in so early that these eggs are not hatched out in the Fall, and the fruit is consumed before the warm weather of the following Spring; and the consumers are none the wiser for having consumed with the fruit millions of insect eggs. In this State, however, these eggs hatch out in the Fall, and very generally destroy the fruit before it is required for consumption. Our dealers generally understand the danger of dealing in sun-dried fruit, and many of them have suffered by so doing; and we, in the line of our business, have also had a little experience, which we will relate:

"While Secretary of the State Agricultural Society, we made an exhibition of some of the products of our State at the International Exposition at Paris. At the State Fair of eighteen hundred and sixty-six, Briggs Brothers, the extensive orchardists of Marysville, exhibited a number of boxes of dried fruits of various kinds, put up in good shape for commerce. The fruit itself was in splendid order, and attracted general attention at the Fair, and we solicited and obtained the whole to send, among other articles, to Paris. After the Fair some two months elapsed before it was time to forward the goods to New York, and the boxes remained in a safe place, undisturbed. When ready to ship we opened one of the boxes, and found that the fruit had turned to a mass of worms. Not one box was found but was in the same condition.

"The peculiarity of our climate, therefore, requires that our fruit be dried by artificial means, or that all the sun-dried fruit, to keep or to ship, be put through some process by which the insects' eggs may be killed. Unless subjected to some process that will effect this, it is neither safe to the individual, or good policy, to ship it out of the State, or to sell it to those who desire to keep it for Winter use."

In the San José *Mercury* of February twenty-seventh, a correspondent, J. Q. A. Ballou, calls in question the correctness of the proposition

that the insect eggs were deposited on the fruit while drying in the sun, or that such eggs are ever so deposited, and that they were deposited in or near the fruit after it was dried and taken out of the sunlight. In support of his theory, he relates his experience in fruit drying as follows, which, being very interesting, and in regard to a very important matter, we quote in full:

"In the Summer of eighteen hundred and sixty-five my first attempt at fruit drying was made. The product—about one thousand four hundred pounds of apricots—was, after being dried, placed in a closely sealed room of a new building, the doors and windows closed securely, and as the room contained nothing else, the fruit was supposed to be secure from insects. The fruit was spread upon the floor. An examination of the fruit in December following, revealed thousands of insects in which there appeared no variety. The insects were recognized as our old acquaintance, whose enmity we had incurred during our apiarian pursuits in former years, being nothing but the moth in arva and pupa states. Having satisfied myself of the nature of the disease, I began to search for a remedy. Knowing that the direct rays of the sun were destructive to the insects up to the fourth stage of its existence, and also that the perfect insect is never or rarely seen on wing in full sunlight, my course was plain, and was as follows: to secure the fruit when fully dry, in such parcels as will prevent the ingress of the enemy; be sure that the packages are close; avoid sacks and all fabrics and rough lumber upon which the insect can find a lodgment for its eggs; secure the fruit before the decline of the sun, or before dampness commences; place the fruit in a dry storeroom—one free from moth is best. If the packages are secure and the room is open to the moth, you may find the larva of the insect on your packages or on the walls, but you will find none in your packages.

"In the season of eighteen hundred and sixty-six, eleven tons of fruit were dried—three shipments of which, pears, were made from the same to New York; the first shipment being made in March, eighteen hundred and sixty-seven, by steamer, consisting of two thousand two hundred pounds. The two other shipments were made in July or August following (the dates are taken from memory and may be inaccurate), by sail vessels, around the Horn. The fruit sold for seventeen, eighteen, and twenty cents per pound respectively. No insects reported.

"The two succeeding crops, consisting principally of plums and prunes, were packed in boxes of ten pounds each, and sold to A. Lusk & Co., San Francisco, the entire lot. The first of the two was sold in May or June, and at the time of its sale no insects were discovered in the fruit. A. Lusk & Co. sold almost the entire lot to Rooler & Co., Denver, Colorado, who also purchased largely, if not all, of the next crop. The price paid us was identically the same for each crop. As no insects were reported, and as both lots were sold at the same figures, it is presumed that none appeared.

"From the crop of eighteen hundred and seventy-three, fifty boxes were retained from sale; these we have now on hand, and by the courtesy of Messrs. Sage & Boggs, First street, San José, we are permitted to place them—together with some samples of the crop of eighteen hundred and seventy-four—in their store, for the inspection of those who feel an interest in this industry. It is proper here to remark that these fruits have been subjected to no process for the purpose of killing the eggs of insects, but have been treated substantially in accordance with the method

herein given. I may add, that this insect is the only one that I have known to infest well desiccated fruit (my observations have extended over a period of eight years, and been conducted with care), and also that it exhibits no preference for any particular mode of desiccation, but attacks all that is exposed. The annual or semi-annual dismantling of our houses, bringing into requisition every available point that will expose our fabrics and furniture to the rays of the sun, attests the preference of this pest as to his abode, as well as suggests the remedy necessary to his extinction.

"I will add, that I have seen one other insect only in fruit. It is a minute brown weevil, and is found only where there is an excess of moisture sufficient to produce alcoholic fermentation, which is of itself sufficient to destroy the fruit."

Whatever may be the real truth as to when and how the insect eggs were deposited in the Briggs fruit, or when and how they are generally deposited in dried fruit, the one prominent fact brought out by the above related experiences, is that fruit while drying, or after being dried, is very liable to have the seeds of this destructive insect's eggs laid upon or near it, and that great caution is necessary to protect it and guard against loss. Mr. Ballou's success in this direction was certainly remarkable, and probably not one person in a thousand would have been as successful. It will be observed that he attributes this success in saving his fruit from the worms to the single fact that the "direct rays of the sun are destructive to the insect up to the fourth stage of its existence, and that the perfect insect is rarely seen on the wing in full sunlight." Now, while it is true that the direct rays of a hot Summer's sun will kill the egg or larvæ of an insect, it is also true that insects, from natural instinct, do not deposit their eggs in such exposed places, but seek the underside of the fruit, and the wrinkles and crevices in the same, and there where the direct rays of the sun, however much the fruit may be turned and manipulated, cannot penetrate, to do the mischief. Again, fruit cannot all be dried in the hot Summer season, but must be continued in the Fall so late that the sun's rays become less direct and effectual in the destruction of insects and eggs. Most of our fruit must be dried in September, and much of it, especially apples, in October, when the rays of the sun, even in the hottest day, will do no harm to the most delicate insect eggs or larvæ, and when insects are most numerous and active in their habits of reproducing their own species.

Mr. Ballou's experience in bee-keeping has doubtless proved to him that the period or danger from the bee moth is not in July and August, but later in the season. From the varieties of fruits dried by him, principally prunes and plums, it is evident his experiments covered the former and not the latter period, and that he did not, therefore, encounter the danger in its worst form and at its worst time. Again, Mr. Ballou is a man of very exact observation and habits and great care, as is evident from the manner in which he conducted his experiments, and as we know from personal acquaintance; and, while he would succeed in keeping insects out of sun-dried fruit ninety-nine others would fail. His success, therefore, under the circumstances, does not change the fact as stated by us, and as attested by general experience, "that sun-dried fruit is practically a failure."

While upon this subject we wish most heartily to indorse Mr. Ballou's plan and care in boxing and keeping dried fruits, whether sun-dried or

preserved by the cheaper and better plans now being so successfully and generally introduced both here and in the Atlantic States. Great caution, in this respect, is absolutely necessary to avoid loss and disappointment, especially in our warm insect-breeding climate.

We will add that we do not agree with Mr. Ballou, as to the limited kinds of insects that infest dried fruit, and we have experience to sustain our views in this respect. This being so important a subject, we would like the experience of fruit growers generally, and will give space to and invite discussion of the subject.—[Sacramento *Record*.

VINICULTURE.

CALIFORNIA'S WINE INTEREST.

VINICULTURE IN THE FOOTHILLS.

CALIFORNIA'S WINE INTEREST.

From the *Quarterly Wine Circular* of J. M. Curtis, we make the following extracts for the valuable information they contain on this important interest in our State:

The current year will long be notable in the annals of our native wine trade. After two disastrous failures, owing to late and severe frosts, with a total yield of only two and a half millions of gallons for eighteen hundred and seventy-three, and four millions for eighteen hundred and seventy-two, we have, in eighteen hundred and seventy-four, a most propitious season, and a promised yield of ten million gallons. There is no reason to doubt that the quality of the vintage will be as good as the quantity is large; for, excepting the recent appearance of mildew in Sonoma and Napa Counties (and the wine growers have adopted prompt and effectual means to counteract it), the green crop promises unusual excellence in every respect. To so handle this large vintage as to make it remunerative to growers, and to place the trade on a sound and enduring basis, is a problem which should command the earnest thought of producers and merchants. If the ten million gallons of eighteen hundred and seventy-four are profitably marketed, not only California, but all the world, will know that one hundred million can just as readily find remunerative sale; and in five years, three hundred thousand acres of barren hills, worthless for other purposes, will be green with the vines which love these sunny slopes so well. While on the other hand, a failure to make this vintage remunerative, will not only check for years the further planting of vines, but cause neglect of the vineyards already established.

To make the crop fairly remunerative, present prices must be sustained, except so far as cost of handling may be reduced by lower rates of freight and labor, and more economical cooperage. The general use of uniform casks, most suitable for the trade, when our coopers are prepared to furnish such casks, will effect a saving of from six to eight per cent on the total value of wine and casks. Further than this we cannot look for an increase of demand arising from lower rates. There is no foreign market to which any considerable quantity of our wine can be profitably shipped until the annual production reaches fully thirty millions of gallons; and there is no probability of an advance in the value of foreign wines which compete with us in the Eastern market, unless it arise from the possible action of Congress in modifying the tariff. Nor can anything more than a temporary benefit be derived from a higher

tariff, for the importation of foreign wines amounts only to nine or ten millions annually. A broader market is required than would result from driving foreign wines away, and that market must be made in our own country, the population of which would be infinitely benefited, both morally and physically, by the consumption annually of thirty millions gallons of pure dry wines. The problem then is, how to teach Americans to drink wine; and on it hinges not only the future of a vast interest in California, but the welfare of a great nation.

The exports of native wine and brandy from January first to June thirtieth of the current year, are:

From—	Quarter ending March 31st.....	Quarter ending June 30th.....	Total.....
	Gallons.	Gallons.	Gallons.
San Francisco, by sea.....	136,626	211,932	348,558
San Francisco, by rail.....	51,208	182,790	233,968
The interior, by rail.....	6,925	22,673	29,598
San Diego, by sea.....	6,348	5,628	11,971
Totals	201,162	423,023	624,125
Same period, 1873.....	226,738	327,406	554,144
Same period, 1872.....	150,024	308,636	458,660

Since the first of July the export demand has fallen off as is usual at this season. There are many orders in hand, however, to go forward about September first, and a fair demand during the balance of the year is anticipated.

The local trade was somewhat dull during the quarter under review, but has rapidly increased during the past month, and for the year will probably equal in volume the trade of eighteen hundred and seventy-three.

Dry wines, both white and red, continue in ample supply, the reds being principally of last year's growth; while there is greater abundance of whites of the growth of eighteen hundred and seventy-two, and earlier vintages. Last year's sweet wines came freely to hand, and are for the most part in good shipping order. Prices for all kinds have ruled steady and firm throughout the year at the quotations below. Brandy is in light supply; the demand small and unsettled. Cooperage is lower than might be expected in the face of a large vintage and light supply of staves. New casks (thin staves) are worth nine cents per gallon; full staves, ten cents for Clear Lake, and ten cents and three quarters to eleven for Eastern oak. Large numbers of old casks (mostly reshipped from New York) have been placed at four to seven cents per gallon.

The prices current for wines, of good shipping quality, in round lots, delivered free on board ship or rail (casks included):

	Per gallon—Gold.
Dry red wines from Mission grapes	$ 45 to 60
Dry red wines from Mission grapes (blended)	55 to 75
Dry white wines from Mission grapes	45 to 55
Dry white wines from Mission grapes (blended)	50 to 65
Dry white wines from Muscat or Muscatelle grapes	60 to 90
Port	70 to 1 00
Angelica	65 to 90
Sweet Tokay	... to 85
Sweet dessert wines	85 to 1 00
Sherry	75 to 1 00
Sparkling wines (fermented), quarts	9 00 to 12 00
Sparkling wines (fermented), pints	10 50 to 14 00
Sparkling wines (charged), quarts	6 50 to 9 00
Sparkling wines (charged), pints	8 00 to 10 50
Wine spirit, per proof gallon	... ... to ... ...
Brandy	1 75 to 2 50

The present rates of freight are:

By sail via Cape Horn to Liverpool or London, six pence per gallon; by sail via Cape Horn to New York, ten cents per gallon, currency; by steamship via Panama (fast), less than two thousand gallons, fifteen cents per gallon, gold; more than two thousand gallons, twelve and one half cents per gallon; by steamship via Panama (slow), less than two thousand gallons, twelve and one half cents per gallon, gold; more than two thousand gallons, ten cents per gallon.

By rail from San Francisco the rates are unsettled. Recent shipments by carloads have been made through to New York at one dollar and fifty cents (currency) per one hundred pounds.

VINICULTURE IN THE FOOTHILLS.

COLOMA GRAPES—WINE AND RAISIN-MAKING IN EL DORADO COUNTY—WATER PRIVILEGES—MADE LANDS—ESTIMATES OF ACRES, CROPS, ETC.

We make the following extracts from a long and well written communication to the Sacramento *Record*, dated at Coloma:

Coloma, the mining camp, is dead; but from its sepulchre has arisen a rare luxuriant wealth of fruit and foliage, of fragrant flowers and heavy laden vines. Sheltered by the grand old mountains, nestling by the river, overgrown with verdure, Coloma is as pretty as the pictures we see of the villages in Rhineland.

A score of vineyards lie in the immediate vicinity, but first among them is the famous property owned by Robert Chalmers, and known throughout the State as—

THE COLOMA VINEYARD.

Situated on either side the road that leads down into town, the beautifully terraced slopes and the regularly laid out rows of vines attract the attention of every passer. Mr. Chalmers has two hundred acres of land, all of which is remarkably adapted to grape culture. On one hundred and ten acres of this he has one hundred and ten thousand bearing vines, comprising over forty varieties of foreign grapes.

VINES TWENTY-TWO YEARS OLD.

The oldest vines were planted twenty-two years ago, and each succeeding year's growth has materially improved both the quality and quantity of the grapes produced. The vineyard has been enlarged year by year. In eighteen hundred and seventy-two he put out ten thousand young vines, and last year he set out thirty thousand cuttings to root for next year's planting. During the first four years of their existence vines should be irrigated. It gives them healthier, stronger roots, and a more vigorous growth. Mr. Chalmers irrigates now after the fourth year. He says that for table use or market, grapes, perhaps, show to better advantage if the vines have been watered; but that for wine making the flavor, richness, and general quality is equally fine without irrigation. Every foot of land for miles around Coloma can be made to produce excellent grapes.

THE RAISIN BUSINESS

Is each year gaining fresh importance. Chalmers has ten thousand vines of the Muscat of Alexandria and Bugbey varieties, and next year's

planting, thirty thousand cuttings, are of these grapes. Their yield is turned into raisins, and amounted, last year, to from six to ten tons. It takes three tons of grapes to make one of raisins. The market price ranges from twelve and a half to fifteen cents per pound, and California varieties were sold last year in preference to the old Malaga grape raisins.

PIONEER MARSHALL'S VINEYARD.

The man who discovered gold, and thus turned thousands of faces Californiaward, was also among the discoverers of the practicability of the industry which has superseded mining. He has fifteen acres of vines, among which are seventy-five varieties of choice grapes. For many years he invested every cent of his earnings in sending East or to Europe for new kinds of vines, and testing their adaptability to the soil and climate of El Dorado County. He sold cuttings and grapes, and the Coloma viniculturists are indebted to him for some of their choicest and most profitable varieties.

MEN AND ACRES.

The following table shows approximately the number of acres of bearing vines in the vicinity of Coloma. The figures may be a trifle too large or too small in individual cases, but the best authorities have been consulted in cases where I did not receive the amounts from the owners themselves:

MEN.	Acres.
COLOMA.	
Robert Chalmers	110
Wm. D. Othick	15
Albert Mosely	6
Patrick Kane	15
R. Macbeth	8
Crocker	12
Peterson	4
Mahler	5
Frank Armstead	20
Frank Gallagher	10
Hooper	10
Barnes	10
Marshall	15
E. Smith	5
Sundry small vineyards	15
UNIONTOWN.	
Ramsay	20
White	30
Mrs. Haun	15
Valentine	10
Cappelman	15

MEN.	Acres.
Haggart	15
Arassmusson	15
Gallagher	10
Lohry	10
MICHIGAN FLAT.	
George E. Williams	25
James Kane	10
August Weimer	20
Andrews	25
Mortisen	12
Jones	12
GOLD HILL.	
Sweeney	12
Tinney	12
Bowser	10
Poteet	15
Newell	25
Veerkamp	40
Tobner	15
O'Brien	20
J. W. Anable	5
G. W. Gale	8
Total	666

Add to this amount the vineyards of Coulterville, in the aggregate, one hundred acres; of Johntown, or Gordon Valley, fifteen acres; of Kelsey, twenty acres; and Georgetown thirty acres, and we have about eight hundred acres of bearing vines in this portion of El Dorado County.

CROPS, MARKETS, RATES, ETC.

The yield this season will be immense, unprecedented. No disease has ever been known among vines in this region, except, perhaps, a little mildew, yet the frost and other meteorological influence sometimes injure crops. This year nothing has marred the vigorous growth of the vintage, and the grape harvest will be abundant. Many loads will be hauled over the mountains to Virginia and Carson markets and sold for four and five cents per pound. Large quantities will be sold to Chalmers and other wine makers, at an average price of fifteen dollars per ton. Many of the leading vine growers have the necessary apparatus and make their own wine. It costs three cents per gallon to convey wine from Coloma to Shingle Springs by means of wagons, the distance being twelve miles. It costs, also, three cents per gallon to convey wine from

Shingle Springs to San Francisco, by means of the railroad, the distance being one hundred and eighty miles.

WATER PRIVILEGES.

During past years it has been difficult to obtain sufficient water at any price to supply the requirements of the orchards and vineyards. At present, the Gold Hill canal supplies second head measure, one by two inches, with a two inch pressure, at twenty-five cents per inch. An acre of vines will require about twenty-two and a half inches of water during the season, thus costing about five dollars and fifty-six cents. The new ditch, when completed, will supply a large scope of country above the altitude of the present canals, and will probably lessen materially the water rates.

MADE LANDS.

It is conceded that one acre of made land in this region is worth five acres of natural. The modus operandi of reclaiming soil washed away by the miners can best be explained by an example: J. R. Munson, of Cold Springs, had about two acres of land that had been mined over and over again until only bed-rock, gravel, and piles of well-washed tailings, remained. Throwing a brush dam around the lower side and end, he turned upon it the muddy waters of a mining creek. In a remarkably short time every inequality was leveled by deposits of sediment, and he had a smooth, even lot, covered four feet deep with fine, close-grained earth. Sand was next sluiced down from the hill-slope above, and uniting with the sediment, formed a rich, loamy soil, which, properly manured, produces crops that are unsurpassed by anything I have ever witnessed. Many of the most valuable lands of Coloma have been thus filled in, on the bedrock of abandoned claims.

BEE CULTURE IN CALIFORNIA.

COTTON GROWING IN CALIFORNIA.

FLAX CULTURE A SUCCESS.

HOGS VERSUS WHEAT.

THE EUCALYPTUS.

AGRICULTURAL MATTERS.

OUR AGRICULTURAL OUTLOOK.

THE AREA OF CALIFORNIA.

"GET A PIECE OF LAND."

CLIMATIC INFLUENCES IN CALIFORNIA.

THE CAPABILITIES OF CALIFORNIA.

SUPPLEMENTARY REPORT ON THE COLORADO DESERT AND ITS SURROUNDINGS.

BEE CULTURE IN CALIFORNIA.

The San Diego *World* treats this subject as follows:

About five years since, J. S. Harbison, the leading apiarist of the State, made a trip through the southern counties in search of bee pasture. He found such good promise that soon after his return he removed a small apiary, in the ownership of which he had associated a Mr. Clark with himself, to San Diego. These were the first bees in that county. The success with which this small venture was attended has since induced Mr. Harbison to gather up all his bees from all other localities and transfer them to the same county. Mr. Harbison has now in that county two thousand hives of bees, which have produced one hundred and fifty thousand pounds, or seventy-five tons of surplus honey of a very excellent quality. Of this he has already shipped per railroad sixty tons to the Eastern States, mostly to Chicago and New York. Mr. Harbison has received some returns from the sales made, and he thinks from these he is warranted in expecting an average of twenty cents per pound for all. At this rate his sales of honey this year will equal the nice little sum of thirty thousand dollars.

This places Mr. Harbison the foremost bee man in the world, so far as money making from the business is concerned, and he undoubtedly occupies the same position as to the knowledge of the business, there not being in the world his equal in this respect. The labor in and about all of his apiaries is now done by apprentices, who are availing themselves of the opportunity to learn the business, while their labor pays their personal expenses. Eight young men are thus engaged, and some of them have become so expert as to be entrusted with the entire management of some of his apiaries. Other parties, since they have learned the success attending the bee business in San Diego County, have also removed a large number there, and good judges estimate the product of the apiaries of the county this year at one hundred thousand dollars.

EXTENT AND NATURE OF BEE PASTURES.

The bee pastures of the southern counties extend from Santa Barbara to Lower California, occupying a belt of country about eight miles wide—commencing about on an average of ten miles from the coast—approaching nearer or receding further back, according to the topography of the country. This belt is a very irregular, broken, mountainous country, mostly unfit for general agricultural purposes, and on this

the bee keepers place their hopes of immunity from the encroaches which have proved their discomfiture in other portions of the State. Experience has shown that the best localities for the apiary is neither at the highest elevation or deepest depression, neither on the mountain nor the valley below, but at a point half way between the two. At this point a medium temperature is secured, and the bees are thus placed where they have access to the earliest food in the valleys below and the latest on the mountain above. The distance the bees have to fly to obtain their food is thus divided, which is no small consideration. One can appreciate this last proposition when he reflects that the bees of Mr. Harbison have this year gathered up and carried to his several apiaries one hundred and fifty thousand pounds of honey. The honey is gathered from a great variety of flowers, but the chief dependence is on a species of white sage which is found in great abundance on the entire range of country, from Santa Barbara to Lower California, averaging about eight miles wide. The bee men are taking up and occupying the best locations in all this region. They are laying out the proceeds of their enterprise and labor in permanent improvements, and are preparing to make permanent homes. Though the principal business and dependence is the apiary, they all cultivate some land and keep some cows, some horses and hogs, and some of them some sheep. We are informed that the bee men alone have done more in the settlement of the County of San Diego this year than all other classes, and more than had been done in the past five years. The land being occupied by the bee keepers has not yet been surveyed and put into the market by the General Government, but they are taking it up with a view to preëmpting it as soon as they can do so, and we understand they propose asking Congress for special legislation to enable them to obtain title to large tracts each.

THE BUSINESS.

Bee keeping is a business, to be successful in, requires long and careful training and preparation, as well as a good degree of practical experience. While, therefore, we would encourage those who have had these advantages to go into the business, and believe they can make it profitable and probably permanent in the portion of the State indicated, we would discourage those who have not had the training and experience necessary, from entering the list on their own account. To such it would be better to first serve an apprenticeship to some one competent to instruct.

COTTON GROWING IN CALIFORNIA.

The evidence that cotton can be successfully and profitably grown in this State is so strong that it is no longer regarded as an experiment. The reports concerning the coming crops for this season are most flattering. The fields in Merced, and other counties, according to our interior exchanges, present a beautiful appearance. The adaptability of the soil to its growth in different sections of the State has been thoroughly tested. The results of these experiments prove conclusively that large bodies of land, which, heretofore, were not supposed susceptible of cultivation, and have been allowed to remained uncultivated, can now be regarded as among the most productive in the State. Colonel Strong is deserving great credit for successfully demonstrating that California is one of the best States in the Union in which to grow cotton. He has never failed in raising a good crop. The cotton grown here is regarded as far superior to that which is raised in the Southern States. It is of excellent quality, being remarkably white and clean, and wholly free from stains of any kind. We believe that it has been sufficiently tested to warrant all of our farmers who have land, to enter into the business of cultivating this staple upon a large scale. From the best information we can get, we learn that the crop this year will be in the neighborhood of four thousand acres, and that the average yield will be, probably, one bale per acre. It can be sold at from twenty to twenty-five cents per pound. At these rates it will be seen that every acre planted to cotton will return from sixty to eighty dollars, while the expense of cultivation will not be greater than that of Indian corn. Those who have grown cotton during the last year or two, say that their profits have been greater than they realized from grain crops on similar land. We doubt not that in a few years cotton will supersede wheat culture to a great extent, and be regarded as the most profitable crop that can be produced on our rich valley lands. This will stimulate manufactures in our midst, and utilize the many fine water privileges our State possesses, by the erection of factories, which will afford profitable employment not now existing for large amounts of labor and capital.

FLAX CULTURE A SUCCESS.

The cultivation of flax for the seed, to be used in the manufacture of linseed oil, has been encouraged for some years past by the Pacific Oil and Lead Works, of San Francisco; and the Salem Oil Mills, of Oregon, have also held out inducements to the farmers of that State to engage in its cultivation there. The mills have been paying from three and a half to four cents a pound for the seed, and at this price the culture has been rendered quite remunerative. We are not aware that any one has yet undertaken to cultivate flax in this State for the lint, but we learn from the Oregon *Daily Bulletin* that the industry has been undertaken there, and has proved successful. That paper has the following on the subject:

The Messrs. Williamson Brothers, from Belfast, Ireland, began the culture of flax for the fiber, in Linn County, last year. They sowed one hundred and twenty acres, and found the soil and climate adapted and the harvest remunerative. They realized, of fine lint, on an average, six hundred pounds per acre, worth five hundred dollars per ton. This was sent to Belfast to be manufactured into various linen fabrics. The first grade of tow is sent to the New York market for other purposes, at a paying rate. The second grade of tow has, in part, been sold to the Oregon Furniture Manufacturing Company, for upholstering purposes, at four cents per pound, or eighty dollars per ton. This second grade tow can be utilized for burlaps with proper machinery. Much of it is baled and sent to California to be manufactured. This product increases so rapidly beyond present consumption that it is left on the ground, we are told, like straw, to rot and waste, or to be burned.

The Messrs. Smith, from North Ireland, raised a large amount of flax in Marion County last year, for shipment to Belfast. Of course the tow must have a nearer market, if sold at all, as the fine lint only bears shipment to Belfast.

The Messrs. Williamson Brothers have already rented four hundred acres, at fifteen dollars per acre, to be sown to flax this year. It is easy to see the profits are large. The culture costs about forty dollars per acre; rent, say fifteen dollars per acre. The lint alone, at six hundred pounds per acre, brings one hundred and fifty dollars. Doubtless other expenses consume a part of the profit.

Would it not be well for California farmers to introduce the culture of flax for the lint, and thus introduce a new and profitable industry, and at the same time raise the material from which their grain bags may be manufactured? There is no doubt but the moist climate of some of our coast counties is remarkably well adapted to flax culture, and we believe that many of our tule or delta islands between or about the mouths of the Sacramento and San Joaquin Rivers, are also good for flax culture. The soil best adapted to flax is a deep loam, that will retain moisture during the season. On such soil, and in the localities indicated, we have no doubt flax culture can be made very profitable.

HOGS VERSUS WHEAT.

There is a growing fear in the minds of many that California may grow more wheat than she will be able to dispose of. Say they, in effect: "Every year the breadth of land sown under that cereal is rapidly increasing, and not only at home with us, but in countries that are our competitors in the world. England is our only great market, and we cannot reasonably hope to sell her more than we do now. What then are we to do with the further surplus that we are certain to have?" To this it might be easily answered, that the more wheat grown in California, the more will be consumed by its own population and by those with whom it has commercial relations—that more wheat necessitates more people engaged in its cultivation, a larger amount of manufactures used by them, a larger number of people at home and abroad engaged in the production of these manufactures, and consequently more mouths to feed than before. It might, perhaps, also be proved that the increased consumption in this way would be sufficient to counterbalance the increased yield. And it could easily be shown that there are many other markets besides those of Great Britain to which we could export.

But admitting, for the sake of argument, that California will soon reach in wheat the point of overproduction so far as regards export to foreign countries, it by no means follows that it is necessary to abandon the further cultivation of that cereal. Wheat may even then be grown and exported in the shape of hog products, such as pork, bacon, hams, lard, etc., and with as much profit to the producer and the intermediate merchants as now. At the present price of wheat, say one dollar and sixty cents per cental, the farmer, after deducting the cost of transportation, bags, etc., does not receive at the utmost more than one dollar and ten cents per cental. Now wheat will produce hog products at the rate of one pound of meat, lard, etc., for every four pounds consumed. Thus a cental of one hundred pounds would produce twenty-five pounds of meat. Pork on foot being worth at the present time five and a half cents per pound at the ranch, a cental would, thus converted into pork, be worth one dollar and thirty-seven and one half cents. So that at the present price of pork on foot, it would be as profitable to use wheat in producing it as to obtain one dollar and eighty-seven and one half cents in San Francisco for the latter. And, save in exceptional seasons, as the last, this price cannot be very greatly exceeded in San Francisco. So much for the paying aspect of hog raising.

Next as to the market, and the price there. Great Britain, the great consumer of the surplus grain, meat, etc., produce of the world, imports annually from the United States over three hundred million pounds of hams, bacon, etc. In addition to that she imports largely from other sources. The United States exports, or will export this year, at the rate

at which exportation has already been going on, about four hundred and fifty million pounds of bacon, hams, pork, and lard. Up to the eleventh of August of this year, from the port of New York alone, there had been exported two hundred and fifty-seven million nine hundred and five thousand five hundred and seventy-four pounds of bacon, hams, and lard, besides nearly one hundred and twenty-seven thousand barrels of pork. This was sent to Great Britain, Germany, the West Indies, Central America and South America, the British North American Colonies, and France. The amount exported and the demand increases every year.

There is no reason why California should not share in the trade, provided she produced the article needed. A dozen years ago, the States east of the Mississippi, Southern Russia, and the Baltic provinces of Prussia, monopolized the wheat market of Great Britain. Last year California outdistanced every one; this year she will do so much more. The price which American bacon, ham, lard, etc., now averages in England, is about twelve and a half cents per pound. It costs one cent per pound to bring hogs to San Francisco, say from Visalia; it would cost say one cent per pound to ship to England, leaving five cents to the packer for expenses in packing and for profit, and this ought to pay.

Thus it may be seen that we are not driven to the necessity of overstocking the markets of the world with wheat and flour. In hog raising there is one alternative, and one which would, besides relieving the farmer from the fear of not being able to find a market, build up a vast and profitable industry in San Francisco.—[*San Francisco Journal of Commerce.*

THE EUCALYPTUS.

In the supplement to *The Colonies*, of twenty-eighth ultimo, an extract was given from the *Daily Telegraph*, referring to the supposed sanitary influences of the eucalyptus, as set forth in a paper read before the French Academy of Science, by M. Gimbert, in which that gentleman ascribes to this tree the valuable power of destroying or counteracting the malarious elements in any situation where it may be introduced. However this may be, it is a well-known fact that in the southern and extra tropical regions of Australia, the extensive swamps which occur in some localities are remarkably free from miasmas of all kinds. Whether this is owing to the influence of the eucalyptus acting as a febrifuge or not, is rather uncertain, as some of the most extensive swamps, in both South Australia and Victoria, are situated far away from any "gum trees," the adjacent trees being either melaleuca, or casuarina, and banksia. Nevertheless, dwellings surrounded by or amidst eucalyptus forests, are always healthy, and their aromatic perfume is pleasant and refreshing, and when borne by the land breeze over the ocean, is welcomed as a grateful odor by newly arrived voyagers.

The genus eucalyptus belongs, in botany, to the great natural order of the myrtaceæ, and comprises a vast variety of shrubs and trees, attaining sometimes a gigantic size (over two hundred feet in altitude), and secreting, more or less, resinous gums, whence their common appellation of "gum trees." Dr. Bentham, in his "Flora Australiensis," enumerates and gives descriptions of no less than one hundred and thirty-five species of true eucalyptus, which may be divided into two classes, viz: those having a smooth bark, which is shed annually in long strips, and those which possess a rough, fixed bark. The former are generally known amongst the Australian colonists as "gum trees," whilst the latter are distinguished, such as "iron bark," "stringy bark," "box," "woolly butt," etc. With the exception of two species extending to the Island of Timor, and, perhaps, two or three somewhat doubtful species from New Guinea and the Indian Archipelago, the eucalypti are all indigenous to Australia, where they constitute the most extensive proportion of the forest vegetation. The vast size, both in girth and height, of some of the species, their great abundance (occurring both in dense forests, and scattered over the country in groups of park-like aspect), as well as the value of their timber and other products, cause them to be well known to all residents in the Australian colonies under a variety of local names, such as "blue," "red," and "white" gum, "peppermint," "turpentine," "stringy bark," and others too numerous to specify. Like most of the native trees peculiar to Australia, all the species of eucalyptus are evergreen, and constitute a peculiar feature in the antipodean landscape. The extraordinary difference in the aspect and character of the foliage of many of the species at different stages

of growth, cannot fail to strike even an indifferent observer. In the young saplings of the "blue gum" (*eucalyptus glauca*) the foliage is glaucous, of a bluish white tint, with the leaves opposite, rounded, and horizontal, and teeming with an oil resembling cajeput. In the adult, the leaves are long, scattered, and rigid, and hang vertically from the branches. The blossoms are generally in small clusters, in color either white or rose-pink, which latter render the tree a pretty object during the Spring months. After the blossom there remains a hard woody calyx of a semi-globular or tube-like form, which contains the seed in a series of cells. These eucalyptus seeds afford food to myriads of black and white cockatoos and other psittacine birds, as do the aromatic leaves of the tree to the opossums that dwell in its hollow "boles."

Many kinds of eucalyptus, especially the "blue gum," are very rapid in their growth upwards, and when planted out soon afford an agreeable shade; though the giants that grow along the courses of the rivers, and ornament in clusters the upland slopes, must have taken many centuries to attain their enormous circumference. The eucalyptus globulus has been naturalized at the Cape, in Algeria, in St. Helena, in Cuba, and in many other places; and thirty years back it was planted in quantities on the Madras hills, to afford a supply of firewood, which was there scarce, and for which its timber is unrivaled, on account of the quantity of resin it contains. In your green-houses it soon attains a great height, as the specimens growing in the Crystal Palace at Sydenham, and the Royal Botanic Gardens, in Regent's Park, well demonstrate. Even as far north as the Island of Jersey it seems to thrive tolerably well in the open air in sheltered situations.

Both the gum which exudes from the stem of these trees, and a decoction of their leaves, are invaluable in cases of dysentery, and have long been used by the settlers and gold-diggers as a cure for that complaint. Dr. Lindley mentions in his "Flora Medica," that the bark of the gum tree is so extremely astringent, as to yield a concrete juice resembling kino, which is gathered and sold as such, being little inferior to the Indian drug. After rain the eucalypti gives out the smell of the camphor with which the glands of the foliage are so abundantly supplied; and the gum (which is at first of a bright crimson color, but afterwards changes to a dark shining red) trickles down the trunk like blood. When dry upon the trunk this gum has so little tenacity as to crumble into fragments. Eucalyptus mannifera (the manna tree of the colonists) grows in abundance near Melbourne. It exudes a whitish, saccharine, mucous substance, resembling manna both in action and appearance, but is less nauseous to the taste. The secretion of the manna takes place during the Summer months; it coagulates, and drops from the leaves on the ground in particles often as large as an almond. It is gathered and eagerly devoured by the blacks, as well as by the children of the settlers. The tree itself is of elegant drooping growth, and attains a height of from sixty to seventy feet. The dwarf "mallee," of the desert scrub, also produces large quantities of another kind of manna of a brown color; and it is affirmed by the natives that the roots of the "mallee," which spread a long distance under the sand, give out, when tapped, a limpid fluid, which serves them as a substitute for water in those arid districts.

The lemon-scented gum tree (*E. citriodora*) is peculiar to the Wide Bay District in Queensland. It is of remarkably rapid growth; a sapling, planted in the Botanic Gardens at Sidney, attained the altitude of thirty-five feet in less than six years. The leaves of this species, when

bruised, yield a delightful citron-like odor, and when dried and placed amongst clothes or papers, impart an agreeable scent to them. Four pounds' weight of the leaves yield by distillation six and a half drachms of a pure colorless oil. A few drops of this oil to an ounce of spirit produce a powerful and fragrant perfume, like "citronella." Samples of this oil may be seen in the Kew Museum.

The timber of many kinds of eucalyptus is valuable for a great variety of purposes, and is utilized throughout the Australian colonies. That of the "blue gum" is excellent for ship-building. It has been stated that a vessel built of "iron bark," "box," *banksia*, and "tea tree" timber, and planked and lined with "flooded gum," "blue gum," and tree-nailed with "iron bark," will attain the highest class given at Lloyd's. The "iron bark" is unequaled in point of durability; its timber is solid and heavy; and when examined in buildings which have been exposed to the vicissitudes of the weather for half a century, it has been found perfectly uninjured. The "stringy bark" is extensively used for flooring boards, and also for fencing land. The "bloodwood" (*E. corymbosa*) supplies a hard, tough, and durable timber, useful for shafts and poles of drays; and the black-butt produces a fine timber for carpenters' work generally. The "box" tree furnishes the material for spokes and felloes of wheels; and the young trees themselves are used for the shafts of gigs, and are unsurpassed by any other kind of wood for that purpose.

Dr. Bennett informs us that some time ago experiments were made in Melbourne to produce gas from the leaves of the eucalyptus. When burning the leaves, a very large proportion of gas arises, producing a brilliant flame from the quantity of oil contained in the glands of the leaf. It has been stated that one ton of gum leaves will produce ten thousand cubic feet of gas—which is equal to that obtained from the best English coal—but the expense of collecting the leaves in a country where the price of labor is so high, seems to have proved an obstacle in carrying out the idea.

AGRICULTURAL MATTERS.

A fruit grower last year made ten dollars net profit on his pear trees of two varieties, namely, Bartlett and Winter Nelles. Some of the cherry growers did not fall much behind these figures. The latter fruit cannot be exported, unless dried. But up to this time the home demand for cherries has kept the price up so that fruit growers have had a satisfactory market. The season for cherries is a short one. But the market has never been glutted, as it sometimes is with strawberries, and other small fruits.

The demand for pears, especially Bartletts, is likely to hold good for years to come, for the reason that they can be sent East from six to eight weeks in advance of pears produced on that side of the country. For this reason our home market will not be overstocked with the fruit. Last year the fruit market was quite bare at times of Bartlett pears, for the reason that the Eastern demand swept the market. There will be no limit to that demand.

An orchard set now with this variety of fruit would probably be more remunerative than any other of the pear variety. We have not so much confidence in the Winter Nelles, because it is a late variety, and one that is produced in great perfection all over the Eastern States. It does not ripen here much in advance of its maturity on the other side of the country.

The fruit grower has to deal practically with the question of a market. He may know of superior varieties of fruit for which there is little demand, and, therefore, does not cultivate them, save for home consumption. What he wants to know is if a given variety will find a good market for years to come. In that event, he can set a new orchard or work over an old one. Old pear trees grafted over will produce new varieties, a few the second year, and more the third. A great many pear orchards have already been grafted to meet the demands of the Eastern market.

Dr. W. P. Gibbons, of Alameda, gives some good advice about the cultivation of the eucalyptus, through the *Rural Press:*

I presume, now, that I am talking to a farmer, who has from one hundred to four hundred acres of land; who has been raising cattle, horses, hogs, and sheep for twelve years past; who has never planted a forest tree on his premises; who has stripped his cañons of the few straggling oaks, which kept up a flowing stream throughout the year; who has spent his money in purchasing fencing for his fields; whose homestead looks as dreary as weather-beaten boards and ash-colored surroundings can make it. I know that there are hundreds of such farmers around, and I wish to show them the money-making aspect of cultivating trees.

You have one hundred acres of ground, then. That will be equivalent

to a square plot of ten acres to each side of two thousand and eighty-six feet, so that the outside of your farm will measure eight thousand three hundred and forty-four feet round. Subsoil a strip twenty-six feet wide round your land; this will take up five acres. Through this strip open four furrows six feet apart, and run the plow through each several times till the soil is loosened deep and finely pulverized. The ground is now prepared for planting.

Take a piece of thick twine or bale-rope some two hundred feet long, untwist and tie through the strands short pieces of rag four feet apart; stretch the line tightly along the center of one of the furrows, and with a dibble make a hole six inches deep and an inch and a half in diameter opposite each mark on the line. Knock off one side of your box containing the plants, and with a trowel or strong knife carefully detach each tree from the soil, disturbing the soil about the roots as little as possible. Then take the tree between the thumb and finger of the left hand, pass its root into a hole to its natural depth, and with a trowel or piece of flat, hard wood pointed at the end, press the dirt around the root, and level the soil about it. In short, plant them just as you would cabbages or tomato plants; but mark this point, be sure that the roots are vertical. You will thus have four rows of trees round your farm, four feet apart in the row, and the rows six feet distant; each row will contain two thousand and eighty-six trees, making an aggregate of eight thousand three hundred and forty-four trees, occupying five acres of your ground. Two men can plant three thousand trees in a day in this manner. They will require no stakes. They must be dressed by the cultivator three times during the first year, and they must receive one plowing and three dressings each succeeding year, for four years.

The following table will give the dimensions of the trees at five years old, and, at every succeeding year, till they are thirteen years old:

Age.	Diameter.	Height.	Wood.
Years.	Inches.	Feet.	In cubic feet.
5	9	40	5.75
6	10	45	8
7	11	50	11.5
8	12	55	14.33
9	13	60	18.49
10	14	65	23
11	15	70	28
12	16	75	34.75
13	17	80	42

On the sixth year, take out every other tree of the first row; seventh year, second row; eighth year, third row; ninth year, fourth row. The amount of cordwood obtained each year will be forty-seven, fifty-seven, ninety-three, and one hundred and sixteen, making a total of three hundred and twenty-three cords. You will now have left four thousand one hundred and seventy-two trees, and the trees will be eight feet apart

in the row. On the tenth, eleventh, twelfth, and thirteenth years take out every other tree, and the amount of cordwood obtained will be seventy-five, ninety-three, one hundred and fourteen, and one hundred and forty, making four hundred and twenty-two cords; making an aggregate of seven hundred and forty-five cords of wood obtained, and a balance of two thousand and eighty-six trees, which will contain six hundred and eighty-four cords. Now sum up the whole operation. Total quantity of wood realized at the end of thirteen years, one thousand four hundred and twenty-nine cords, at a cost of—

Seed	$5
Preparing five acres of ground	15
Six days' labor, planting	12
Subsequent cultivation	60
Total cost	$92

A farm of one hundred and sixty acres treated in this way, on the supposition that it is treeless, will have doubled in value at the expiration of ten years, leaving out of question all other improvements. Of course there are many other varieties of trees which are desirable, but none grow so fast as the eucalyptus. All over the State one may see wind-swept, arid farms, having not a single attractive feature about them. They need reclaiming just as much as the tule lands along the rivers. Where a growth of trees has been obtained along the boundaries, or in groups on the windward side, the revolution which has been wrought in the physical character of such a farm is wonderful. The north wind is one of the great crop-destroyers of this State. Wherever these desiccating blasts can be broken by barricades of living trees, an important point will have been gained. There will be an increase of moisture, a constant protection to crops, a perpetual supply of wood and timber without destroying what is necessary for ornament and wind-breakers. In no other country can changes for the better be wrought in the whole appearance of a farm or homestead so rapidly as here. Every man who expects to live on his farm is interested in making it as attractive as possible. Every tree well set increases its resources and directly affects its value. A farm without both fruit and forest trees, can never be an attractive homestead. Where trees abound, living water will not be far off.

OUR AGRICULTURAL OUTLOOK.

Since the late rains the farmers all over the State have been actively engaged in plowing and preparing their grounds for seeding. Thus far the rains and fair weather have been exactly in accordance with their wishes, and they are evidently making the most of it. From the best information we have been able to get within the last week or two, we are of the opinion that the area of wheat sown this Fall and Winter in the State will be considerably in excess of that of last year. It may be considered rather early to begin to canvass our agricultural prospects for the coming year to any great extent, but it may be safely said that at no previous year in the history of the State has the outlook been more promising at the end of November. Far-seeing farmers are beginning to realize that the present year has more than ever demonstrated the fact that their true policy is to mix the crops. There never was a time when the agriculturists of California could appreciate the necessity of having a variety of products to rely upon more than just now, when the wheat market is only a nominal matter, and our great staple is almost a lifeless commodity upon their hands. We hope for better things, but we cannot depend upon any improvement; and we realize that we are liable any year to meet with the same stagnation that is upon us at the present time. And now comes the question: What shall constitute the crop of the future? In old and well regulated farming countries, where a good system of rotating, or alternating, has been adopted and practiced for a long time, it is customary for each farmer to follow his own judgment upon such matters, and the aggregate of the farm products generally comes out all right. But such farmers always take a careful and thoughtful survey of the outlook, canvassing every circumstance that may have a bearing on the productions of his farm, as well as the probabilities of a profitable market for those productions. We are aware of the difficulties in the way of making any radical change in a newly settled country like that of our own. The farmer who has grown nothing but wheat for years, with good success, is very apt to think that he cannot cultivate any other product on his land that will be equally as remunerative. We are sincerely of the opinion that diversified farming, when intelligently engaged in, will, in the long run, be found more profitable than wheat growing exclusively. It is certain that cotton growing in California can be made, by careful and proper management, as successful at least as that of wheat. There is no doubt but tobacco of the very best quality can be raised here; and the profit of this production is an immense percentage over that of wheat. The ramie will grow luxuriantly, and as the proper machinery has recently been invented by which this textile can be utilized, we see no reason why it should not be cultivated on a large scale, and placed among our leading exports. Flax

culture has been tried and proved a fair success. Hops are naturally adapted to our soil and climate, and we learn that the present year promises to be a profitable one for the hop grower. The Alden fruit drying process is another opening for enterprise, which will give value to the surplus fruit of our numerous orchards that now goes to waste. We might mention many other articles which would be profitable productions in this State, such as the sugar-beet, hemp, jute, silk, English walnuts, oranges, raisins, lemons, etc. Let the fact once be clearly proven to the farmers of our State that a much more profitable return can be got from these crops than from grain raising, and they will turn their attention to new channels. We are not opposed to wheat growing, if cultivated in addition to other products. One continuous crop year after year will ruin the best land in the world. A change of crops will give land a chance to recuperate. Besides, a variety will be the means of adding to the wealth and importance of our State in many ways. It will create manufactures, thereby inducing immigration that will settle up the waste places with thriving communities.

THE AREA OF CALIFORNIA.

For the information of those who have never visited the Pacific Coast, we will give the area of our State. It is not a State so much as an empire, with its one hundred and eighty-eight thousand nine hundred and eighty-one square miles, or one hundred and thirty million nine hundred and twenty-seven thousand eight hundred and forty acres. A recent authority makes the following showing: The combined area of the six New England States is but sixty-eight thousand three hundred and thirty-eight square miles, showing that California has an area almost three times as great as this division of the republic. The area of the six Middle States—New York, New Jersey, Pennsylvania, Delaware, Maryland, and West Virginia—is one hundred and thirty-seven thousand four hundred and sixty-four square miles, showing that the area of California is fifty-one thousand five hundred and seventeen square miles larger than this section. The combined area of the twelve States forming the New England and Middle States is two hundred and five thousand eight hundred and twelve square miles, showing that California contains an area almost as great as these twelve States. It is seventy-eight thousand two hundred and thirty-five square miles larger than the whole of Great Britain—the latter being one hundred and ten thousand eight hundred and fifty-six square miles. It would make twenty-four States the size of Massachusetts, leaving two thousand seven hundred and eighty-four square miles; and the area of California would make one hundred and forty-five States as large as the State of Rhode Island.

"GET A PIECE OF LAND."

The following article, with the above heading, which is floating about without an author, contains solid advice, and we reproduce it, hoping it will prove a word in season to some of our readers:

Almost twenty-one years ago, when making preparations to leave for California, a land that seemed as far away as Timbuctoo or Samarcand, we met, for a moment only, an old friend, a planter. "What is the word?" says he. "I am going to California," we replied. "Well, I have but one piece of advice to give you—get a piece of land;" and, shaking hands and looking us in the face, he repeated, "Get a piece of land—good-by." We have not seen or heard of him since. But a thousand times since then we have remembered his parting injunction, "Get a piece of land," expressing, as it did, the whole science which has made the fortune of so many of our people, as well as of the millionaires of the East; a science which lies at the hearth of so many happy homes, which makes and keeps the best portion of a State's inhabitants honest, prosperous, and independent. When, after years had passed, and the soil and climate of California had been proved about the best in the world for the production of our cereals, and our earlier ideas that the country was fit only for miners in the mountains and coyotes in the valleys, had been exploded by the facts of agriculture; when we saw that intelligent men had got possession of the best lands, and farmers were becoming rich, often would come up in mind the injunction of our planter friend, "Get a piece of land," and no one could abuse our want of forethought more than we did.

Seventeen years ago a friend advised us to go and secure some lots along the line of Mission street, which had then just been opened as a plank road by Colonel Wilson—and, by the way, he was the man that advised us. He had a somewhat appreciative sense of what the future would produce. We had gold enough to have purchased half a dozen hundred-vara lots. We went out one hot day, waded for hours over the sandhills from Second street to Yerba Buena Cemetery, and came back hot, sweaty, dusty, thirsty, tired, and disgusted, and with such a total incapacity to imagine that such a desolate region could, within a few years, become a busy mart for business, and homes for tens of thousands of people, and filled with such contempt for the whole region, that we would not have given five dollars an acre for a quarter section of it. A few years later, traveling through the well built up streets of that once despised section, like the voice of a ghost from the past, almost like the grating accusation of remorse, came along the wires of memory, our planter friend's injunction, "Get a piece of land."

Many of us may go into the country, a few miles from this city, and see farms in splendid condition, in their season waving with crops of heavy-headed grain, fine herds of fat cattle chewing their cuds while standing up to their knees in clover and rich grasses, delicious butter

and cheese in the dairies, fat pigs grunting in happy ignorance of approaching Christmas, and hens cackling over their last contribution to the farmer's wealth; and we remember when we could have bought the land of that farm for a song. But we thought it adobe, and did not think it wise to "get a piece of land."

It is not too late yet in this State; perhaps not in this city. There is plenty of land that can be purchased for one fifth what it will be worth ten years hence. Wherefore, we would say to young men and others, do not hang about the city looking for clerkships and bookkeeper's berths—treadmills that wear out and wear down the bodies and souls of men—but go into the country and "get a piece of land." There will be an exhibition of manhood, of honorable pride, of independence, that will be creditable, and will insure eventual success. No matter if you have to live in a shanty five or even ten years. You will be independent, a freeman—under the dictation of nobody, in the direct line of honest labor and honest triumph.

CLIMATIC INFLUENCES IN CALIFORNIA.

The influence of climate upon race has obtained a sufficient general recognition to be accepted without demonstration. Buckle, in his fragmentary work on English civilization, endeavored to prove that climate and soil are the two main features in determining the character of the race. Geographical position, perhaps, would be a more acceptable definition of his theory, since he included, by necessity, the hydrography and topography of the land. Herbert Spencer, in his forthcoming work on Sociology, devotes some space to a consideration of the influence of climate on social development, and deduces from the facts which he cites the conclusion that while civilization, once established, appears to flourish best in the temperate zone, the most energetic tribes and nations have been produced in hot and dry climates. The alliance of heat with humidity seems to tend toward the production of lower intelligences, darker skins, and more languid motives, but great heat with little moisture tends to bring forth combatant, aggressive, restless, and daring races, such as the Assyrians, Babylonians, Scythians, and so forth, of old. It is a fact, however, which is not sufficiently considered, that the thermometer is a very deceptive test of temperature, and that estimates based upon it, without taking into account other climatic and meteorological phenomena, are very likely to be false. The climate of California is, take it for all in all, one of the most agreeable in the world; and yet there are apparent heated terms in this State, the mean of the thermometrical record of which would give foreigners a very erroneous idea of the real condition of the atmosphere. It may be doubted, indeed, whether there is another region on earth where the climatic conditions suited to the preservation of robust health and agreeable to the senses are so nicely balanced. In our great valleys the Summers are hot, but there is just so much moisture in the air that the heat is not oppressive, and at the same time the sluices of the skin are permitted to act freely, and thus relieve the lungs and circulation. The mean temperature of Sacramento in the present month is seventy-three degrees Fahrenheit; that of Vallejo is sixty-three degrees; and that of San Francisco is fifty-seven degrees. If we compare the average temperature in Summer and Winter, however, we shall at once perceive that there is greater uniformity here than in most other regions. For example, the January and July temperature of Sacramento exhibit a difference of only twenty-eight degrees. The same seasons in New York show a difference of forty-four degrees; and so on. It is true that great differences of temperature may be found between various places in California, but taking the seasons throughout the year, it is apparent that we have here an equable climate.

Of the effect of climatic conditions on the race much might be said, for probably there is no place in the world where the influence of climate has been so marked in changing even well defined types. It is not an exaggeration to assert that between the inhabitants of the Atlantic

and Middle States, and the residents of California, there is as much difference as between the people of New York and the people of Liverpool; and it is no less obvious a fact that the climatic difference on this coast is in the direction of an Anglo-Saxon type. When our forefathers landed on Plymouth Rock they were burly, ruddy, full-veined, and stalwart Englishmen. The influence of climatic extremes in the long interval that has elapsed, has changed the type, and we find to-day that the typical male American of the Eastern States is lank, gaunt, narrow-chested, spindle-shanked, lantern-jawed, with high cheek-bones, deep-set eyes, and sallow complexions; while the female American of the Eastern States is delicately framed, of fragile proportions, premature development, exquisite complexion, great nervous activity, and short-lived beauty, both of face and form. And now mark the magic transformation effected upon these people by a ten years' residence in California. The gaunt form of the man fills up, the narrow chest expands, the spindle shanks acquire robust calves, the lantern jaws plump up, the sallow skin clears and brightens, the haggard, anxious look is replaced by one of genial comfort and enjoyment of life. With the Eastern women, assuming her to be moderately youthful, the change is not less surprising. The fragility, which in her old home made her resemble a delicate porcelain figure, gives place to a vigorous health that laughs at double windows and rejects registers; her waxen pallor disappears, and the rich blood mantles brilliantly in her well-filled cheeks. No longer is she languid and enervated, but throws herself into all the varied occupations which present themselves with an energy and vivacity unknown before. In a word, our Eastern cousins are metamorphosed into Anglo-Saxons. Despite themselves, and without the least regard to their possible prejudices, nature has transformed them into capital types of the best breed of Englishmen and English women. Eastern travelers constantly notice this striking change, and the Englishmen who have passed through the States on their way to this coast are amazed to find themselves, in the streets of San Francisco, among a population whose leading physical traits remind them of nothing they have seen since they landed on Castle Garden, but recall at once the faces and forms which they have been accustomed to regard as distinctively English. Nobody ever saw in the Eastern States children that look like those of California. Nowhere is those regions is there found the abounding health and animal force that mark the rising generation here. It is not to be denied that Eastern parents living in California have done their best to spoil their children by subjecting them to the abominably unwholesome dietary which has grown into favor among that sallow and dyspeptic people; but nature is too strong even for a steady course of hot cakes, leaden pastry, and clogging sweets. Some day we hope Californians will learn to cook. They know nothing about it as yet, and nearly all their ideas upon the vital subject of foods are crude and wrong. But when we see what the magnificent climate does for mankind in this high favored region, it seems to us that there is justification for the belief that California may be marked out for the production of a world shaping race, and that here are destined to be cradled the men and women who shall mold the future of this whole continent. Certainly the conditions of social development are nowhere else so favorable. Nowhere else is the soil so fertile, the atmosphere so genial, the local influences so inspiring, the capacity to live with every sense and faculty so perfect. And where else, this being so, than in California, should the coming race be nurtured and developed?—*Sac. Record.*

THE CAPABILITIES OF CALIFORNIA.

The following able article, written for the San José *Granger* by a correspondent under the *nom de plume* of "Uncle John," will be found highly instructive and interesting to the farming element of our newly-arrived immigration:

The majority of people, on their arrival among us, are highly pleased with everything that comes under their experience or observation. They have left a country that, when compared with ours, seems peculiarly subject to vicissitudes and casualties; they have left a land where the terrible heat of Summer, and the more terrible cold of Winter, destroys many of its inhabitants; where lightning, tornadoes, inundations, conflagrations, and disease, are all active agents for the destruction of human life. But in California it is all different. The climate, soil, scenery, and productions all seem to come as near perfection as possible; and from the awful effects of floods, storms, and conflagrations, we should say, with thankful hearts, we are peculiarly exempt. But after considering and appreciating these blessings, our Eastern friends begin to look around for a business of some kind—for something to do for a living. It is then that discouragement begins. Merchandising, the trades and professions seem to be overdone and full to overflowing. Grain raising and fruit raising, they are told by farmers of the slack persuasion, "doesn't pay." It is admitted by everybody that dairying, and stock and sheep farming, does pay; but these branches of business all do not understand, and require considerable capital. Now, let us fairly and squarely consider this question of a bread-winning business. We will admit that we have merchants enough, though new ones often come among us and set themselves up in business, and seem to do well. As to trades and professions, the great Daniel Webster once said, by way of encouragement, to a young man who came to him for advice, "There is always room in the upper story." A first-class mechanic, lawyer, or physician, can always find profitable employment in any part of the Union. This is as true in California as elsewhere. But it would not be so in the physician's case, were it not that so many invalids and wrecks of humanity come here from other countries to regain their lost health.

Diversified farming possesses great advantages, and wherever practiced with skill and judgment, is sure to be remunerative. There are very few farms where the following branches of business will not pay: Butter making, cattle raising, poultry raising, and grain raising. Of course, each department should be graduated according to facilities. In addition, every farmer should raise his own horses and pork, vegetables and fruit—enough for home consumption. There are many farms in Santa Clara Valley which have been for years devoted to grain alone, and shallow plowing and unceasing cropping have made them unprofitable, while, if the diversified plan had been followed, their owners would to-day be rich and independent. To illustrate:

Many years ago—nearly twenty—Farmer A. owned and occupied a farm in Santa Clara Valley, near the foothills. The soil was rich, and mere scratching with a plow was sufficient to produce good crops of grain; and not only that, two or three good volunteer crops could be had from once plowing and sowing. The plan was followed for several years. Grain brought a fair price, and Farmer A. was happy; he and his family lived easy, and spent their money freely. But, by and by, the land began to fail; weeds and wild oats came so plentifully in the volunteer crops that that way of grain raising had to be given up, and the land was plowed every year; but it was still grain each year, and no rest for the land. Farmer A. found that in a "dry year" his crops failed altogether, and in the best years they were light. These "dry years," as they are called, by the by, have been the salvation of the country, for had it not been for the rest to the land which they afforded, a large portion of it would have ere this been "run" to death.

Well, Farmer A. said that farming didn't pay, and to save himself from bankruptcy, sold his farm. Mr. B., an intelligent Eastern farmer, was the purchaser. The neighbors smiled when they spoke of him, and said that the farm would soon starve him out. The tract comprised one hundred and fifty acres of valley land of fair quality. Farmer B. divided it into four fields. He had but little extra money, but managed to get a few cows and young stock, and reserving one field for a pasture, put them in it. There was a good fall of rain that Winter, and Farmer B. put his plow down in good old Eastern style, and plowed as near a foot in depth as he could, and turned up soil that had not seen the light for centuries. The neighbors politely told him he was a fool, and would get nothing for his pains. After his grain crops were sown, a neighbor found him one day deeply cross plowing a piece of ground near his house. "What are you going to raise here?" he said. "Well," said Farmer B., "there was a large pile of old manure where the old barn used to stand. I have spread the most of it on this piece of land, and am going to try to grow corn and vegetables." "Let me tell you," said the neighbor, "that corn and vegetables won't grow in this soil; it's too gravelly and dry, and the sun will burn them to death." Invariably, when Farmer B. put in practice his system of thorough farming, discouraging advice was dealt out to him unsparingly; but he persisted in carrying out his plan, and thanking his neighbors for their kindness, he told them he would try his way of farming one or two years, and if it did not pay, he would adopt theirs. Now, what is the result? It is six years since Farmer B. made his purchase. His first grain crop was only an ordinary one, but all since then have been excellent. His plan of affording some rest to his land by pasturing has proved very beneficial. His vegetable crop has always been a profitable one, and the same neighbors who said they would not grow, have repeatedly bought of him, saying they were much better than any that could be procured in town. Farmer B. has been deservedly prosperous, having something each year to sell in the line of grain, fruit, vegetables, pork, butter, stock, poultry, etc., and the aggregate amount is quite satisfactory. He has lately planted a few acres to almonds and the raisin grape, and will, no doubt, make them a success. But the thrift and prosperity which is everywhere conspicuous upon his farm must not by any means be all credited to him; his worthy wife should come in for an equal share of praise. Without the cheerful coöperation of this lady, the result would

have been far less satisfactory. There is another idea we must banish from our minds, that though Farmer B. and his wife are industrious, they are not drudges, but always find time to attend the Grange and other meetings, as well as picnics, visiting in the neighborhood, etc. He says he can well afford to spend a portion of his time in this manner, for in the meantime his crops, his calves, and his pigs do not stop growing, his hens do not stop laying, but all are increasing during his absence. Such men, who develop the resources of the soil in so splendid a manner, cannot but encourage immigration, and are of far more benefit to the country than millionaires, who have come among us to loan their money. The men who once said Farmer B. was a fool have since changed their minds, and now want to make him Master of the Grange. There is room in Santa Clara County for two thousand Farmer B's, and we cordially invite them to come.

SUPPLEMENTARY REPORT

ON

The Colorado Desert and its Surroundings.

W. S. Chapman, Esq.:

Dear Sir: On examining the report of Mr. J. E. James, there seems to be some points in relation to the Colorado desert, and its peculiarities, which have not yet been touched upon at all, or not sufficiently elaborated:

The reclamation of this desert, so as to obviate the evil results dependent on its presence and location, may be looked at in two ways: we may destroy its desert character by submerging the land, and thus replacing the desert by a lake, or chain of lakes, of large area, and, consequently, of powerful climatic influence; or, we may clothe the desert with vegetation by means of extended irrigation; and it becomes an important question to decide whether the results from the latter mode would be equivalent to those obtained by the former, and whether irrigation is feasible; because, if it is, it would be evidently wiser policy to retain the land, than to destroy it by submersion, although in its present condition it is not only useless for all practical purposes, but a positive injury to the country in its vicinity. Either course would involve large expenditures of money, and the nature of the examination into the problems presented is of such a character as almost to preclude the accomplishment of it by private means, even if such a course were desirable, when the matter is one of public interest. While you have accomplished much, there is vastly more to be done, and the investigation will require resources and appliances which only the Government has at its command. It may be well at the outset to look first at the nature of the evils suffered by the surrounding country, and inquire if they are traceable to the presence of this desert region, and its high temperature. These are briefly, first, the prevalence of what are known as "land storms;" second, of hot, desiccating winds; and, third, by the deficient rainfalls.

First—The continuance of the southeast winds for any lengthened period invariably brings these "sand storms" through the Tehachape and Tejon passes into the southern portion of the San Joaquin and Tulare Valleys, and through other passes to the southward into the plains of Los Angeles. The winds derive the name of sand storms from the large amount of sand and fine gravel which they hold in suspension, and drive before them. This feature gives them an immense destructive power aside from terrible desiccating properties. Their erosive action is well illustrated in the Tejon or Tehachape pass (I do

not now remember which, and have not the notes before me). Professor Blake, in speaking of the rocks in one of these passes, notes that they contain large numbers of garnets, and as these are much harder than the rock in which they are embedded, they have resisted in a greater degree erosive action of these storms, which have worn the face of the rocks, so to speak, into long fingers, each tipped with a garnet, and all pointing in the direction from which these winds usually blow. Here we have a practical illustration of the power of the sand blast, and if its effect has been such upon the rocks, it is not difficult to imagine what it must be on the tender Spring vegetation.

Their temperature and drying capabilities require no further or more complete illustration than a simple statement of the fact that during their prevalence at San Diego, the merchants are compelled to keep their books in presses to prevent the backs from curling up, as they do if unprotected, in exactly the same manner as if placed before a hot fire. That these winds acquire their baleful properties on the desert is easily shown. They are essentially southeast winds, more or less modified by the topography of the region over which they blow. They reach the desert as cool winds from the Gulf of California. On the desert they acquire the temperature and lose their moisture by evaporation, at the same time acquiring their burden of sand from the ridges on the north of the desert, and in their altered character find their way through the mountain passes on the north and west, into the fertile plains of Kern and Los Angeles Counties.

Second—It would also seem that the presence of this desert is a practical bar to the rainfall in the region occupied by it, and diminishes to a serious extent that in the surrounding region to the north and west. A large portion of the desert, so called, is a desert only because of the absence of rainfall. The vegetation on the desert, whenever it exists, is due to the overflow of the Colorado River, and its rapid growth to the fertility of the soil, which is a deep alluvium, and the warm temperature of the nights, which in Summer rarely falls below seventy degrees Fahrenheit. This vegetation derives no nourishment from any rainfall; it is due solely to the effects of the overflow, and if no overflow occurs, is wanting. The absence of rain is well illustrated by the meadows near New River Station. In these meadows the grass which was standing on them at the time of Mr. James' visit, grew and matured three years ago, and yet is good feed for stock. Had any rain fallen upon it, it would have been quickly destroyed, as are all the dry pastures of California at the commencement of the rainy season. These facts are nothing more than might be expected. The rain-bearing clouds of California come from the southeast and southwest. Those from the southeast follow the Gulf of California, and on reaching the desert, as shown by Mr. James, have their temperature so increased that their rain is dissipated or carried by the upward current and rarefaction into higher regions, to be deposited partially further to the northward. In the same way the westerly winds drawing in to supply the vacuum caused by the rarefaction of the air above the desert are brought into contact with these warm currents, and, instead of releasing their contents, are dissipated in a similar manner. Now, a large portion of the San Joaquin Valley is dependent on these southeast winds for its rainfall, and it is necessary that these rain-laden winds should not be interrupted. The southwestern rain winds deposit most of their rainfalls on the Coast Range which lies between the San Joaquin Valley and the ocean, and must ever do so, on account of the structural peculiarities of California, but the mountain

chains break off at the southern end of the valley, and there is nothing to prevent the ingress of the southeast winds except the furnace presented by the large desert, and over which they are compelled to blow. The question then is presented, How shall we so change the nature of this area that it shall no longer interfere with these southeast winds? If we can reduce its temperature, should we not induce a rainfall within its limits and increase that in its neighborhood, thus increasing the productiveness of all Southern California?

Whether the submersion of a portion of these lands would so increase the value of the remainder that there would practically be no loss of value, is a question which we have not sufficient data at hand to enable us to take up at the present stage of inquiry, but that such a submersion of a very large area is feasible, can readily be shown. It might be accomplished either with fresh or salt water, though the former method might largely interfere, for a time at least, with the navigation of the Colorado River. From Death Valley, in latitude thirty-six degrees, to the State line, in latitude thirty-three degrees, or thereabouts, or over a region of country north and south for a distance of two hundred and fifty miles, there is a series of depressions covering large areas which are below sea-level. The most southerly of these can certainly be filled with sea water from the Gulf of California, as shown by the accompanying map and profiles; whether those to the northward are connected with this depression, or whether they can be filled from the Colorado, is one of the objects of future investigation. But if this large lake, or chain of lakes, were established, it is more than likely that they would modify the climate to a very appreciable extent. The water surface would not absorb the same amount of heat, and become so intensely hot as the present unprotected earth, and we might reasonably expect, from the known phenomena in other localities, that it would attract the rain-clouds instead of dispersing them, thus accomplishing the result sought for.

But we also know that if the ground be protected by vegetation, pretty much the same results would follow, and as the explorations so far made have shown the exuberant fertility of much of this land when thoroughly watered, and also to some extent the feasibility of supplying large areas of it from the Colorado River, it would seem eminently worth while to investigate still further the relation of that river to these plains, to determine whether a portion of its waters may not be diverted at various points, and used in the irrigation of these lands.

The absolute certainty that if so watered vegetation will spring up in a few weeks, that this vegetation will tend to prevent the evaporation of the moisture, while at the same time it will act as a precipitant for whatever moisture the atmosphere may carry, would lead us to expect much from this plan of reclamation, while we should utilize all the ground instead of destroying any portion of it.

It might, however, prove on investigation that a combination of both plans might be most desirable. This, in the present state of our knowledge, it is impossible to determine, but under any circumstances there are few more profitable or desirable lines of inquiry open in California to-day.

As bearing on this question, it may not be out of place to note, as pointed out by Major Baldwin, who has recently been over a portion of this region, that at Collville, at the head of navigation on the Colorado, the elevation is about one thousand feet above sea-level, and that at this point there is a break in the big cañon of the Colorado and a level pass

to the westward, through which, it is more than probable, that the Colorado once flowed into Death Valley, and from thence, through the chain of lakes previously spoken of, to the Gulf of California. This locality deserves further investigation, for the mind is irresistibly drawn to the conclusion that the decadence of Arizona dates from the time when the great Colorado had cut down its bed in the big cañon so deep that its course was diverted at Collville to a southerly direction, and the lakes which once existed in Southern California, and were by it supplied, gradually evaporated, to become the desolate sinks of insignificant streams, or broad arid deserts. What the former influence of the lakes was may be partially judged by the phenomena of both Winter and Summer rains in the valleys south of Salt Lake, which follow the lakes between Sevier Lake and the great Salt Lake, and make a habitable region in the midst of a desert. It is not unreasonable to conclude that the Aztec civilization of Arizona, of which there are so many traces, was founded on a similar condition of things, perishing only when this condition was destroyed.

That the influence of these broad deserts is prejudicial may be further seen in the gradually diminishing rainfall from Oregon to Southern California, and in the stoppage of the Summer rains of Sonora and Arizona before they reach San Bernardino County, although the latter properly belongs to the area affected by them. Again, the great amount of water in the Colorado during the present Winter has caused a large overflow in the desert through the channel of New River, and San Diego has had an abundant rainfall. May not this be the result, in part, of the diminution in the temperature of the desert, owing to the presence of large bodies of water on the lower Colorado?

These are merely suggestions, but they are worth consideration.

Yours, very respectfully,

RICHARD H. STRETCH.

INDUSTRIAL SURVEYS

OF

COLUSA COUNTY.

SAN DIEGO COUNTY.

SONOMA COUNTY.

INDUSTRIAL SURVEY OF COLUSA COUNTY.

ITS SITUATION, EXTENT, SURFACE, AND RESOURCES.

THE SACRAMENTO RIVER—SLOUGHS—TIMBER—SOIL—PRODUCTIONS OF THE SOIL—CLIMATE—HEALTH—PROPERTY—VALUES—WHEAT—WOOL—LIVE STOCK—IRRIGATION AND RECLAMATION—THE TOWN OF COLUSA—PRINCETON AND OTHER SHIPPING POINTS—A RAILROAD WANTED—HISTORICAL SKETCH.

[ORIGINALLY WRITTEN FOR AND PUBLISHED BY THE SACRAMENTO RECORD, BY WILL S. GREEN, EDITOR OF THE COLUSA SUN.]

Colusa County comprises a large portion of the great Sacramento Valley. It is bounded on the north by Tehama, on the east by Butte and Sutter, on the south by Yolo, and on the west by Lake and Mendocino. The southern boundary corresponds very nearly with the thirty-ninth degree of north latitude. It is eighty miles north of San Francisco, and a north line from the city would run through the county about twenty-five miles west of the county seat. The county is sixty miles from north to south, and averages about forty-five miles from east to west, and consequently contains about two thousand eight hundred square miles. Of this about one thousand five hundred square miles lies in the Sacramento Valley. As the "summit of the Coast Range" joins the western boundary, the balance of the area is composed of mountains, low hills, and smaller valleys. The valley portion of this balance we have estimated at two hundred square miles, the low hills at seven hundred square miles, and the mountains at four hundred square miles. The mountains have, in this estimate, an apparently small area assigned them; but, although the line calls for the "summit," it really runs from the southern boundary on a low spur, until about the middle of the county, from north to south, where the spur connects with the mountain proper—the

absolute "summit" being west of Clear Lake. The mountain ranges run north and south. About twenty miles north of the south boundary, however, there is a kind of divide separating the waters of Cache Creek, running south, from those of Stony Creek, running north. These creeks enter the Sacramento Valley about seventy-five miles apart, and no creek enters it from the mountains between them, but these creeks gather up the waters of the mountains, run in opposite directions, and finally turn abruptly to the east and run out into the valley. The country between these waters and the plains is covered with low hills, in which creeks have their rise, which run east to the plains and empty into the "trough" mentioned below. None of these creeks, however, run more than a mile or so in the plains, except during a rain storm, or for a short time after heavy rains. Stony Creek, after running north about forty miles to the extreme northern end of the county, turns east into the valley, and takes a course a few degrees south of east, to the Sacramento River. No creek empties directly into the river between Stony Creek and the bay.

THE SACRAMENTO RIVER

Running almost due south, forms the eastern boundary of the county for eighteen miles, then runs through the county twenty-four miles, in a straight line, and again forms the eastern boundary. The general course of the river, from the upper to the lower end of the county, is a little east of south, making twelve miles of easting in the sixty miles of southing. Stony Creek enters the river seven miles below the north boundary, and about six miles below that the natural overflow of the river bank runs back from the river into a trough, and from that point to its mouth the river runs on a ridge like the Mississippi. The land falls gradually back from the river for three or four miles, and then very gradually rises to the foothills. It is the same on both sides, except that on the east side, Butte Creek—a living stream, and the eastern boundary of the county—runs down the bottom of the trough, until at the lower end of that portion of the county, on the east side of the river, it loses itself in the tule. The average width of the land overflowed by the sloughs putting out from the river, and by the creeks that come down from the foothills, was given, prior to any leveeing of the river, about two miles for about twenty-five miles from the head of the trough, when the trough became straighter and wider, and a tule was formed.

THE RIVER IS NAVIGABLE

All the year round to the upper end of the county. It has not been affected here by the work of the miners in the mountains, and has not, like the Feather, the Yuba, the American, and other rivers, filled up since the inauguration of hydraulic mining, but its waters are perfectly clear, except when swollen by rains. Up to the Town of Colusa—twenty-two miles above the southern line—steamers tow barges carrying as much as

SEVEN HUNDRED TONS.

Above that point, three hundred tons is considered a fair load. This being the case, freights can never be more than two or three dollars a ton, on heavy articles of produce, from the Town of Colusa to the bay. From the river to the bottom of the trough above mentioned is called "river lands," and from there to the foothills "plain lands." The soil

of the one was made by sediment brought down by the river; the other, by the creeks running from the low hills. The fall of the river from the upper end of the county to Colusa is eighteen inches to the mile, and from that place down, it is six inches only. As a consequence of this, the upper river has more rapids and bars, and it also washes its banks and changes its position more. The average width of the river is something over three hundred feet. The height of the banks at low water is about twenty-one feet. About eighteen miles above the south line of the county, Butte Slough, which is over one hundred feet wide, runs out of the river on the east side as soon as there is any rise whatever in the river, and spreads out over the tule lands of Sutter County. Butte Creek empties into this slough about three miles below its head, and these streams form the eastern and southern boundary of the county on that side of the river.

SYCAMORE SLOUGH

Makes out from the river, on the west side, some four miles below Butte Slough, and runs about six miles in a southwesterly direction, turns more to the south and runs southeast, and in ten or twelve miles loses its channel in the tule. But the great slough putting into the river from the tule at Knight's Landing, in Yolo County, and about thirty miles from the head of the slough, takes the name of the Lower Sycamore, and the body of land between the river and the slough, is known as Grand Island This island, partly in Colusa and partly in Yolo County, is all of the river formation, and is as fine land as any in the world. No water runs through the slough until the river rises about four feet above low water. The river grows narrower as those sloughs run out.

TIMBER.

The river is skirted on either side with a growth of timber, averaging a mile in width, principally oaks, with sycamore, cottonwood, and ash. Much of this along the lower end of the county has been cut off, and sold in the shape of cordwood—supplying the steamers on the river, and the City of Sacramento; some of it, in fact, going to San Francisco. This timber is not used for building purposes. Some of the low hills are covered with a kind of post oak and digger pine, while the others are bald. Along the Coast Range, there is much very fine pine timber, but as yet there has been but little of it used, lumber of the same kind being more accessible in the mountains on the east side of the valley. This will become valuable in the future.

WATER.

People in the valley have to depend upon wells for water. The average depth of wells is, perhaps, about twenty feet. All along the river lands water is found in the wells when a level of the water in the river is reached. The depth on the plains varies somewhat with the localities, but over nine tenths of the county is reached in from ten to twenty feet. There is one place in the southwestern portion of the county where water is not reached in less than seventy-five to one hundred feet, and this is not higher than the other portions of the plains. This district has a queer geological formation, indicating that it has at one time sunk down below the level of the country around it. In digging wells

there it is no uncommon thing to find bones and timber at a depth of seventy-five or one hundred feet. One man took up most of the skeleton of a deer, and another found chunks and coals lying around as though a camp fire had just been extinguished. Very good water can be had by digging almost all over the valley, but in many districts the surface water is strongly impregnated with alkali; but bored wells are both cheaper and better, and are now in general use. In the alkali districts even, very good water is had by boring down sixty or seventy feet and putting down piping to keep out the surface water. There are springs of water all through the foothills, but many settlers there get the water they use from wells. Stony creek, and two or three other smaller streams, offer opportunities for water-power, but at present these places are out of the line of trade, and have not been utilized.

CHARACTER OF THE SOIL.

To fully appreciate the fertility of the soil of the Sacramento Valley, one must have seen it in its wild state, as we saw it in eighteen hundred and fifty. All along the river, the timber lands were covered with pea vine ten or twelve feet high, the open land with wild oats from four to seven feet high, varied with an occasional patch of clover, so matted and thick that one could scarcely travel through it. The soil, as we have said, was made by the sediment of the river, in which there is a great deal of vegetable matter. The soil of the plains is more varied in character. The creeks that we have mentioned as rising in the low hills and running out into the plains, have each formed a ridge and runs above the land on each side. Thus a person traveling parallel with the river would encounter a succession of rises and depressions. These vary from five to perhaps twenty feet in height. Generally along and near these creeks the soil is of a rich sandy loam. Between these, the lower land is generally composed more of clay, and is colder and harder. In fact, sometimes basins have been formed by these creeks, throwing up ridges to run upon, so that the water could not run off freely, and it caused the land to become close and packed, and the water drawing all the alkaline matter from the land, and then evaporating, caused the land to become crusted with alkali, and to become entirely unproductive. This occurs, however, only in spots, and fifty square miles would perhaps have embraced it all at any time, but the alkali spots are now fast disappearing. When we get within about fifteen miles of the northern line of the county, we meet with more or less red rolling land, upon which bunch grass grew in a wild state, and which was classed as too poor for cultivation until the last two or three years, but it is now considered very fine wheat land. Much of the soil of the low hills is good, and produces grass for cattle and sheep ranges. The valleys in the hills are all fine agricultural land. The price of the river land ranges from ten to forty dollars per acre; of the plain land, from five to twenty-five dollars per acre.

CLIMATE.

The average Summer heat—taking the hottest part of each day—is about ninety degrees of Fahrenheit. The average temperature in Winter is about sixty degrees. The extreme heat is about one hundred and fifteen degrees, the extreme cold thirty-two degrees above zero. It is very seldom that ice is formed, and never over half an inch in thickness. Snow has fallen twice since eighteen hundred and forty-nine, to

the depth of one foot, in the valley. The mountains are covered with snow every Winter. The effect of the heat is so different from that of the Eastern States that after a residence of twenty years in Colusa, we happened to be in Springfield, Illinois, in the month of June, when the thermometer marked ninety degrees, and the heat became so intolerably oppressive that we started at once for the Sacramento Valley. The summit of the coast mountains is said to have the best climate for invalids in the world, and every Summer hundreds of people flock thither, and camp out. The rainfall is, so far as we have been able to judge, about the same as at Sacramento.

PRODUCTIONS OF THE SOIL.

The principal production so far has been wheat and other small grain, but experiments fully prove that both the soil and climate are favorable in the extreme to the production of cotton, tobacco, hops, castor beans, flax, broom corn, all manner of vegetables and fruit, not excepting oranges and lemons. Some years ago J. P. Bainbridge planted eight acres of tobacco, and gathered one thousand pounds of fine tobacco to the acre. He would have continued the crop had he remained on the same land. The quality of the tobacco was excellent. Cotton has been tried by Andrew Rutland the present season. We had hoped to have been able to have procured his balance sheet for this paper, but the cotton is not yet all ginned. Cotton must, in the very near future, be one of the principal products of the Sacramento Valley. Sixty bushels of wheat to the acre is no uncommon thing, but this is not claimed as an average. As at present farmed, the average is not, perhaps, above twenty bushels, but we maintain that with any degree of care the average can be brought up to thirty bushels. The figures that follow will give an idea of the progress of agriculture in this county.

SOME FIGURES AND COMPARISONS.

The first assessment, made in eighteen hundred and fifty-one, footed up three hundred and seventy-three thousand two hundred and six dollars. For the fiscal year eighteen hundred and sixty–sixty-one, the totals on the assessment roll show the following valuations: real estate, five hundred and ninety-three thousand three hundred and eighty-six dollars; improvements assessed to others than the owners of real estate, fifty thousand three hundred and seventy-two dollars; personal property, nine hundred and thirty-four thousand three hundred and eight dollars; total assessment, one million five hundred and eighty-one thousand and sixty-six dollars. For eighteen hundred and seventy–seventy-one we find: real estate, two million three hundred and eighty thousand one hundred and four dollars; improvements assessed to other than the owners of land, twenty-three thousand one hundred and seventy-five dollars; personal property, one million nine hundred and thirty-five thousand seven hundred and sixty-two dollars; total, four million three hundred and thirty-nine thousand and forty-one dollars. For eighteen hundred and seventy-four, as follows: real estate, five million five hundred and eighty-six thousand one hundred and fifty-seven dollars; improvements, seven hundred and forty-one thousand five hundred and fifty-seven dollars; personal property, two million eight hundred and twelve thousand one hundred and thirty-six dollars; total, nine million one hundred and nineteen thousand eight hundred and fifty dollars.

THE PRINCIPAL EXPORTS

Of the county at present are wheat, wool, and live stock. The present season the county has produced about one hundred thousand tons of wheat, and will export between eighty thousand and ninety thousand tons. The clip of wool last Spring is estimated by competent judges at one million pounds. From so large a number of sheep there must be an annual sale of a large number of mutton sheep. Not less than eight thousand hogs have been exported the present season—one man having shipped to the San Francisco market, in the month of November, six thousand head. A large number of beef cattle are also sold annually. The county has also a very large number of fine stock of all kinds.

IRRIGATION AND RECLAMATION.

The entire valley portion of the county is capable of being irrigated, either by the waters of Stony Creek, or, by going up the river into Tehama County, the waters of the river itself can be used. The cost of either would not be great in proportion to the benefits. In order to reclaim their land the owners of the swamp or tule land, above mentioned, have leveed the river, on the west side, from Knight's Landing almost to the head of the "trough." They now have to contend with the water from the low hills, but they are now planning to stop this out. Much of this tule land has been rendered fit for cultivation by the work already done. The river on the east side is now being leveed.

THE MINES.

In the southwestern portion of the county some very fine quicksilver mines have been opened, and although no great outlay has been made, twenty or twenty-five flasks of quicksilver are shipped each week from Colusa. By Spring these will be increased to hundreds. Several good prospects for silver have been found in the Coast Range, but as miners have been incredulous about the existence of the precious metals in this region, but little prospecting has been done. Copper has been found in large quantities in the mountains. There are several mineral springs of great value in the mountains on the west side of the county.

THE TOWN OF COLUSA

Is situated on the west bank of the Sacramento River, twenty-two miles north of the southern line of the county. The banks of the river at this point are high—were not overflowed during the wet Winter of eighteen hundred and forty-nine–fifty; but since the banks have been worn down, and the channel of the river raised somewhat by the stoppage of sloughs, a small levee has become necessary, but the expense of keeping the levee up is very small. The town, as incorporated, extends for a mile up and down the river, but an "extension" on either end increases it to about a mile and a half, by three quarters of a mile back. About two thousand five hundred inhabitants are scattered over this territory. The town site was once thickly covered with large forest oaks, and many of them are remaining at the present time. This is the center of trade for the country we have just been describing, and if the scope of this paper was not limited to a plain relation of facts, without

even a too free use of adjectives, we think we could prove that it is destined to become the third or fourth city of importance in California. Navigation to Colusa is excellent, and while freight from Chico, only forty miles further from the bay, is six dollars and fifty cents per ton, and from Woodland, forty miles nearer the bay, is three dollars, the freight from Colusa, on produce, is only three dollars, and it has been taken as low as two dollars and fifty cents per ton. It is the shipping point for the mines as well as for the agricultural region around it. The travel for Wilber's, Allen's, Bartlett's, and Foot's Springs, situate in the Coast Range, in Colusa and Lake Counties, passes through Colusa. Last Summer no less than ten stages left Colusa every morning for different points. Except a very good flouring mill, no manufactories have been erected at Colusa, although several are badly needed. It is evident from the resources above indicated of the surrounding country, that no better investments could be made than in the several branches of manufacture at Colusa. An instance, showing the thrift of the people of the town, might be mentioned: a tax of sixty-five cents on the one hundred dollars of taxable property was levied this year for town purposes, and every dollar of the tax was collected without a single person being returned delinquent. The town has a very fine public school house, erected at a cost of about fifteen thousand dollars, besides which it maintains two first-class private schools. It has four churches—Christian, Catholic, Methodist, and Presbyterian.

PRINCETON AND OTHER SHIPPING POINTS.

Fourteen miles above Colusa there has sprung up a town of about two hundred inhabitants, which bids fair to become a thriving village. Wheat is hauled in on wagons from the country back to the nearest shipping point on the river, and there is a very rich section back of Princeton. By the time the present shipping season is over, there will have been shipped from Princeton about twelve thousand tons of wheat. There are several other shipping points along the river at which large warehouses have been erected. The present season there have been erected, on Grand Island, four warehouses, with an aggregate capacity of about twenty thousand tons. At Colusa, one new one, three hundred and twenty by one hundred and twenty feet, which, with the houses already there, gives a capacity of twenty thousand tons. The warehouse room at Princeton and Jacinto—Dr. Glenn's farm—will give a capacity of perhaps fifteen thousand tons. These, besides the granaries on the farms, give good facilities for caring for the produce of the county.

The population of the county has been estimated at fifteen thousand.

WANT OF A RAILROAD.

Although the river is better of itself than a railroad, yet a road up the west side of the Sacramento River would be of very great advantage to the county. From the Town of Colusa we must either take a boat, thirty-five miles (straight) to Knight's Landing to connect with the cars, or the stage, twenty-five miles, to Marysville. From other parts of the county persons must come to Colusa to get out. In these fast times everybody understands the necessity of railroad communication. The California Pacific would have extended their road up as far as Colusa long ago, had it not fallen into litigation, stopping everything like exten-

sion. It will not be long, however, before a county like this will have a railroad.

HISTORICAL GLANCE.

A history of the county appeared in the Colusa *Sun* of January third, eighteen hundred and seventy-three, from which we compile as follows: The Town of Colusa is older than the county. Dr. Semple, who came to California in eighteen hundred and forty-six, visited this section in eighteen hundred and forty-eight, there being then in the Colusa region but two houses. One was that of Thomas O. Larkin, where John Boggs now resides; the other, on Stony Creek, owned and occupied by Swift & Lewis. Semple, in that year, rafted down the Sacramento. As he viewed the magnificent land, as he floated along, he foresaw its value and advantages, and then predicted a city would grow up at Colus Rancheria, then on the present site of Colusa.

In eighteen hundred and forty-nine, his brother, Charles D. Semple, came to California, and he advised him to buy a grant of land claimed by John Bidwell. This he did, January twenty-second, eighteen hundred and fifty, and in April he came up in the steamer Martha Jane, landing at the Seven-Mile House, where he found a branch rancheria of Colus Indians, having passed the original rancheria without seeing it. He laid out a town at his landing and called it Colusa, adding an *a* to the Indian tribal name. He built a fine steamer in eighteen hundred and fifty—the Colusa—and she ran up to the new town, but her engines were unfit, and she was over a week getting up. The town site was seen to be an error, and in August the present town was located and a map made after surveys.

THE NAME "COLUSA"

Is derived from an Indian tribal name, "Colus," which the Indians pronounced somewhat like "Coru," accenting the last syllable. The signification of the word is "Scratch," and the Indians were known as the "Scratch Indians." For a long time the county name was spelled "Colusi." This manner of spelling was insisted upon by General M. G. Vallejo in the Legislature.

There was from the first a rivalry between Colusa and Monroeville, located on the mouth of Stony Creek, and the Monroe partisans stuck to the "i" because it provoked the Colusa partisans. Monroe was willing enough to have the town spelled with the "a," and he insisted that there was and should be a difference between the town and county.

THE COUNTY

Was created in eighteen hundred and fifty, and attached to Butte for judicial purposes. In the Fall of eighteen hundred and fifty, on petition made, an election for county officers was ordered for January tenth, eighteen hundred and fifty-one, under an Act providing for the organization of the county. The county was organized under this Act, and the county seat fixed at Monroe's Ranch, which was at the mouth of Stony Creek, without any further authority than the order of Judge Bean directing the first election to be held there. After two Acts of the Legislature on the subject, and two elections, the county seat was, finally, in eighteen hundred and fifty-four, located at Colusa. For the first three years Judge William B. Ide filled all the offices of the county

by deputyship, and the following certificate illustrates the way he had to do business:

I hereby certify that I have collected of the tax Colusi County, for the year eighteen hundred and fifty-one, three hundred and twenty-five dollars and twenty-eight cents in coin, and one receipt of B. H. Thomes—nine fifty—exclusive of my fee of five per cent for collecting, and other taxes I have not collected, to this I certify on my oath, according to the best of my knowledge and belief.

Attest, WM. B. IDE, Treasurer,
Joseph C. Huls.

U. P. Monroe, Auditor.
By Wm. B. Ide, Deputy.

Sworn and signed before me, and in my presence, this twenty-fifth day of December, eighteen hundred and fifty-one, Colusi County.

WM. B. IDE,
County Judge of Colusi County.

INDUSTRIAL SURVEY OF SAN DIEGO COUNTY.

SOIL, CLIMATE, AND PRODUCTIONS—TROPICAL AND TEMPERATE FRUITS—GRAIN—MINERAL RESOURCES—STATISTICS OF SCHOOLS, CHURCHES, PUBLIC BUILDINGS—WEALTH AND COMMERCE—BANKS—THERMOMETRICAL OBSERVATIONS—RAINFALL—GENERAL OBSERVATIONS—HISTORY OF GROWTH.

San Diego County is one of the largest in the United States, being more than twice the area of the State of Massachusetts, located in the extreme southern portion of California, extending from the Pacific Ocean on the west across the entire State, to the Colorado River on the east, and from the boundary of Lower California, on the south, to the line of Los Angeles and San Bernardino Counties on the north, covering an area nearly one hundred miles in width by more than one hundred and fifty in length, and containing over eight and a half millions of acres.

Of this vast extent not more than one million acres have been occupied, and about one half of this is held by parties in tracts of ten thousand acres and more. This is nearly all within a short distance of the coast, or what might properly be termed the coast division, and contains two thirds of the present population of the county. The few thousand acres of cultivated land is mostly in this area, but the larger portion is used for grazing purposes, and furnishes pasturage for one hundred and fifty thousand sheep, twenty thousand cattle, and large numbers of horses, mules, goats, etc.

The Colorado desert, on the east, comprises about two and a half million acres. A part of this is loose, shifting sand, but the major portion contains a soil rich in every element but water for the growth of all kinds of grain, fruit, and vegetables, while the subject of turning the waters of the Colorado River for its reclamation has already been brought to the attention of Congress by the introduction of a bill for its survey by the Government. That section known as the New River Valley, where the river overflows, is exceedingly fertile, and produces three crops annually.

Running north and south through the county are two ranges of mountains, one east of the coast division, the other west of the Colorado desert, and between these two ranges is found the richest portion of the county—an area, the extent and resources of which are sufficient for the support of a population of a hundred thousand—the importance of which is but just beginning to be known, and its development but just commenced. Its natural wealth is inexhaustible, and is unsurpassed in its richness and diversity of resources by any equal area of country in the State. Here are found large and fertile valleys, unaffected by drought, where crops can be raised every year, and where sheep and cattle graze during both Summer and Winter; the mountains are covered

with fine timber, such as pine, spruce, cedar, live oak, etc., and along their base lie the gold quartz mining districts of the county. This section, so rich in the resources needed to build up a commercial center, only awaits the opening of an outlet to a market by the advent of the railroad on its proposed line through San Gorgonio Pass, to be occupied by a large and thrifty class. Here are thousands of acres of Government land which ere long will become a portion of the productive "back country" of this port.

Previous to eighteen hundred and sixty-eight this county was one vast stock range, while comparatively nothing had been done in the way of raising cereals or fruit, and as we have had three seasons of drought since then, the efforts in that direction have been limited, but the past favorable season has given an impetus in that direction which will, if continued, soon change the character of the export products. Enough has been done, however, to demonstrate that both soil and climate are adapted to the growth of all kinds of grain, the yield the past season being about two hundred thousand centals of wheat, fifty thousand centals of barley, in addition to the general crops of the section, while the yield of fruits, so far as they have been grown, will compare favorably with any locality in flavor, size, and productiveness.

GRAIN.

In some sections of the county every year, and in all sections in favorable ones, grain of all kinds may be grown, yet the future wealth of this county will come largely from its production of fruits, as it is so well adapted to the growth of all kinds, from the hardy fruits of the North to the semi-tropical ones of the Southern clime.

FRUIT.

Practical experiments have demonstrated that lemons, limes, guavas, almonds, figs, pomegranates, olives, and Italian and Spanish chestnuts, are adapted to this locality, while orange and English walnut trees flourish, and, when of sufficient age, there is no reason why they should not produce as good fruit as those of our neighboring counties. Apples, pears, peaches, quinces, nectarines, apricots, and grapes are unexcelled for general culture, while some of the other varieties, like plums, cherries, etc., will require experienced cultivators to make them a success. Berries of all kinds do well, but require a large amount of water.

There is scarcely a variety of fruit for which we annually pay large sums to foreign nations, but might be grown here, and many of them of a superior quality. The climate is not only favorable for their production, but for curing such as require drying, and this county alone might in a short time supply the United States with fruits for which we now send abroad.

The choice varieties of figs do much better here than in more northerly sections, and the cured fruit is equal to any imported. This county is especially adapted to the cultivation of grapes; the finer varieties, such as will not mature in climates where frosts prevail, are grown, producing abundantly the largest and most delicious fruit. Table and raisin grapes are the principal varieties.

As to which kind of fruit shall eventually prove the most profitable, it is too soon to tell. The olive has been cultivated at the mission, six miles from the bay, for seventy-five years, and the trees are to-day ap-

parently as vigorous as ever, the product of the past season being the best in quality ever grown. As these trees commence bearing when three years old, producing from fifty to seventy-five gallons per tree when fully grown, it will be seen that the olive, at least, is destined to be one of the leading varieties. The oil is worth four and a half to six dollars per gallon, and the pickled fruit seventy-five cents per gallon. It is a handsome evergreen, and these trees scattered over the surrounding hills would soon change them to fields of perpetual verdure, and yield a sure and rich reward for their cultivation.

TOBACCO—COTTON—HONEY—ETC.

The experiments that have been made in the cultivation of tobacco have been very satisfactory, both as to quantity and quality, and this will soon become an article of export. Castor beans are also attracting considerable attention, thirty thousand pounds having been shipped from here this year. Experiments have also been made in growing cotton, and while the staple is good, not enough has been grown to test the yield. Cotton planters say that both soil and climate are favorable, and there is no reason why the yield should not be good.

At the present time the honey business is one of the important resources of the county, and has increased from a yield of fifteen hundred pounds in eighteen hundred and sixty-nine, to a shipping surplus of not less than four hundred thousand pounds, Messrs. Clark & Harbison alone shipping two hundred and six thousand pounds. There are now over forty apiaries in the county, and the export surplus next year will probably be about one million pounds.

The chief articles of exportation from the port of San Diego this year (given in the order of their importance) are gold bullion, wheat, wool, honey, salt, whale oil, flour, hides and pelts, dried fish, tallow, castor beans, early potatoes, and beeswax.

PROGRESS.

There has been wonderful progress in this county during the past five years. The population has increased from less than one thousand in eighteen hundred and sixty-eight to more than ten thousand at this time, and the taxable property from four hundred and seventy-one thousand six hundred and ninety-one dollars, to three million one hundred and nineteen thousand seven hundred dollars. The export products, which in eighteen hundred and sixty-nine were less than one hundred thousand dollars, will not be less than two million dollars in eighteen hundred and seventy-four, while the three leading export products—wheat, wool, and honey—will be more than doubled for the season of eighteen hundred and seventy-five.

MINERAL RESOURCES.

As early as eighteen hundred and twenty-eight, gold was shipped from this port, and sufficient discoveries were made from eighteen hundred and fifty-nine to eighteen hundred and sixty-four, to warrant the erection of a quartz mill on what is now known as the Wolfskill Rancho, about thirty-five miles northwest of San Diego, which was worked for about two years, and from the discovery of the mine until that time about a hundred thousand dollars was taken out. It was not, however,

until the discovery of the Washington ledge, in the Julian District, on the twenty-second of February, eighteen hundred and seventy, that this could be considered a successful mining region, but since that time it has been looked upon as one of the richest gold-producing sections of the State. Soon after the discovery of gold there the owners of the Cuyamaca Rancho attempted to float their grant over the mining district, and for four years contested the claim, until the case was finally disposed of by the Land Department, and decided in favor of the miners, in July last. This question of title has been the means of keeping out all foreign capital. The first discoverers were inexperienced, and yet, so rich were the mines that they have continued to be developed. The history of the mining section is peculiar, from the fact that the development has been done entirely from the products of the mines themselves, and bullion to a very large amount taken out. With the settlement of the Cuyamaca case the introduction of capital commenced, and with the experience gained by those now there, we may surely look for a largely increased production of the precious metals from this locality. At this time there are more than twenty well defined gold mines, of which eleven have proved to be of great value, and there are not less than seventy-five stamps running in the Julian and Banner Districts. This industry gives employment to hundreds of laborers, and others, and is building up a substantial and permanent business, and giving a healthy activity to the agricultural resources of that section.

COUNTY SCHOOL STATISTICS.

In eighteen hundred and sixty-eight, not a school house had been built in the county. Now the schools are systemized, and though the percentage of scholars enrolled is small, yet when we consider the sparseness of the population, and the large area covered by nearly all the districts, the proportion is not remarkably small. The following statement is compiled from the report of the County Superintendent made July thirtieth, eighteen hundred and seventy-four: Number of school districts, twenty-one; children between five and seventeen, one thousand seven hundred and twenty-eight; children under five, six hundred and fifty-five; number attending public schools during the year, eight hundred and thirty-one; average number belonging, five hundred and thirty-six; average daily attendance, four hundred and eighty-one; number attending private schools who have not been in the public schools, ninety-five; number between five and seventeen not attending any school, eight hundred and two.

THE CITY OF SAN DIEGO

Is the oldest settlement in California, having been located by Spanish missionaries in May, seventeen hundred and sixty-nine, at the time of founding the Mission of San Diego. The title to the city, which contains about eleven leagues, or forty-seven thousand three hundred and twenty-three acres of land, is derived from a grant by the Mexican Government to the City of San Diego, which grant has been confirmed by the Land Department at Washington, and the boundaries settled and defined. It was nearly a hundred years from its first settlement before anything was done towards making it a commercial point. The original settlement was inland, and to the northwest of the bay, comprising

what is now known as Old San Diego. Here were a few hundred inhabitants, principally Mexicans, living almost entirely in adobe buildings, and subsisting on the traffic with the stock-raisers of the surrounding country. A steamer arrived once a month from San Francisco, and, as there was no wharf, passengers and freight were landed in small boats and lighters.

In May, eighteen hundred and sixty-seven, Mr. A. E. Horton purchased from the city authorities some eight hundred acres of land, about three miles from the old town, a portion of which terminated on the bay, and laid it out into a town site. It comprises what is known as New San Diego. He came here, as he expressed it, to build a city, and he has succeeded in laying the solid foundation for one. Others have been attracted hither, and have done much toward building up the place; but to the energy and perseverance of this one man is due in a great degree its present commercial importance. He has helped in all public enterprises, and alone built up some of the most needed and important improvements, while his entire time and accumulated wealth have thus far been devoted to making this a city which will, at no distant day, be one of marvelous beauty and enduring stability.

LOCATION OF HARBOR, STATISTICS, ETC.

San Diego harbor is situated in latitude thirty-two degrees forty minutes north, and longitude one hundred and seventeen degrees twelve minutes west, the mouth of the harbor being about eighteen miles from the Mexican border. The channel of the bay curves to the southward, and is navigable to within six or eight miles of the Mexican line. On the west, protecting it from the prevailing winds, rises a high range of hills, terminating at Point Loma, the highest lighthouse station on the coast, while stretching between the bay and ocean is a peninsula from one fourth of a mile to a mile in width, serving as a breakwater and protecting the bay from the southeastern storms, leaving the harbor perfectly landlocked, where vessels can lie at anchor during the wildest storms as safely as in the calmest weather.

The harbor has a channel twelve miles long, and an average of nearly half a mile in width, with a depth at extreme low tide of from twenty to fifty-one feet, while at the sides of this deep channel is as much more available water, with a depth of from twelve to twenty feet, thus furnishing anchorage for thousands of vessels.

Professor George Davidson, Assistant United States Coast Survey, in charge Pacific Coast, makes the following statement in reference to the harbor:

"There is a depth of twenty-two feet of water on the bar, at the mean of the lowest low waters. The average rise and fall of tides is three feet seven inches. The average rise and fall of Spring tides is five feet. The average rise and fall of neap tides is two feet three inches. The width of the channel over the bar carrying the foregoing depth, is about six hundred yards; the distance across the bar, between one hundred and two hundred yards.

"The depth of water on San Diego bar compares favorably with the depth on the entrances to the Atlantic harbors. Boston has about eighteen feet; New York, twenty-three and a half feet; Philadelphia, eighteen and a half feet; Charleston, Mobile, and New Orleans, less than eighteen feet.

"There is a noteworthy fact in relation to the depth of water on the bar of San Diego Bay; a comparison of the surveys of Dalrymple, in seventeen hundred and eighty-two, and Vancouver, in seventeen hundred and ninety-three, and the last United States Coast Survey examinations, show no change to have taken place since the former date.

"The bottom is uniformly good. No rocks have been discovered in the bay or approaches. The position of San Diego Bay with relation to the coast and of the bar with relation to Point Loma, is such that there is rarely much swell on the bar; in Summer, there are not many days of heavy southeast weather. As a rule, there is less swell on this bar than on any other bar on the Pacific Coast.

"I consider the approaches, the channel, and the facilities of entering and leaving good, at all ordinary seasons, for all vessels not drawing over twenty feet of water; and at high water for vessels drawing twenty-two feet."

With testimony like this, from such authority, there can be no doubt of the facilities of the harbor to meet the demands of commerce.

While the trade of our own State is not an unimportant item, yet when the Pacific and Atlantic Coasts shall be united by the iron rails of rival roads, the great struggle will be for the carrying trade between the Orient and the European and Atlantic ports of our own country, and the one possessing the greatest advantages will become the Pacific Coast port of transhipment; and these advantages are claimed for San Diego.

Having been designated by Congress as the western terminus of the Texas and Pacific Railway—a road which will be built south of the snow belt—her business connections with the East will not be interrupted by the snow blockade. The distance from here to New York is four hundred and twenty-three miles less than from San Francisco, and we are five hundred miles nearer to China, Japan, and the South Sea islands, thus saving nearly one thousand miles between New York and the latter countries—and as shipping expense by steamer from New Orleans or Galveston to Europe would be about the same as from New York, goods from China or Japan for Europe, by this route, will save the expense of one thousand and four hundred miles of rail transportation over the present route via San Francisco and New York. The completion of the railroad will make this the natural gateway through which must pass supplies for the rich mineral regions of New Mexico, Arizona, and the Northern Mexican States, in addition to those of Southern California, and these combined, form the richest mineral region in the world.

These, with the safety of the harbor and its approaches, together with the fact that from three to four days may be saved between Europe and Asia by this route, are some of the advantages claimed, and the latter fact alone, in this fast age, when the great endeavor seems to be to annihilate time and space, will give it the preference.

There are four wharves on the bay—one at Roseville, on the west side and near the mouth of the harbor, owned by Louis Rose; two at New San Diego, one owned by William Jorres, and occupied by Goodall, Nelson & Perkins' steamship line, the other owned and occupied by the Pacific Mail Company; and one at National City, five miles further up the bay, owned by the Kimball Brothers. The wharves at New San Diego have commodious warehouses to each.

During the year eighteen hundred and seventy-four there has arrived

in this port two hundred and one steamers and thirty sailing vessels, with an aggregate tonnage of one hundred and ninety-nine thousand three hundred and twenty-two tons. The freight landed, exclusive of lumber, has been seventeen thousand three hundred and eighty-five tons; of lumber, two million five hundred and seventy-eight thousand two hundred and one feet; lath, four hundred and seventy-seven thousand eight hundred; shakes, two hundred thousand one hundred and seventy-five; shingles, six hundred and ten thousand.

Only one vessel load of the surplus wheat has as yet been shipped, but a very large proportion of the balance is now in the warehouses. The shipments of the Pacific Mail Steamship Company to December eighteenth, have been as follows: honey, three hundred and sixty six thousand eight hundred and eighty-eight pounds; beeswax, two thousand seven hundred and ninety-five pounds; wool, seven hundred and sixty-six thousand and nine pounds; early potatoes, nineteen thousand three hundred and twelve pounds; dried fish, one hundred and sixty-five thousand five hundred pounds; flour, seventy-nine thousand pounds; salt, one hundred and seven thousand pounds; tallow, eight thousand five hundred and ninety pounds; castor beans, thirty thousand pounds; wine, sixty thousand and forty-seven gallons; whale oil, twenty-one thousand six hundred gallons; dry hides, eight thousand four hundred and thirty-one; salt hides, three hundred and fifteen bundles; skins and pelts, ninety-four bundles. The Goodall, Nelson & Perkins agency here has kept no record of shipments, but as their steamer departures alternate with the coast line of the Pacific Mail Steamship Company, the estimate should be made accordingly. The shipment of gold bullion up to the seventh of December, as reported by Wells, Fargo & Co., has been two hundred and twenty-eight thousand six hundred and fifteen dollars and seventy-five cents; of this about forty thousand dollars has come from Lower California. In addition to the above, there have been large amounts taken by private parties.

POPULATION, WEALTH, ETC.

The population of the city is between four and five thousand. During the past year the county has increased in population more than the city, the inducements for agricultural pursuits having drawn a great many thither, and yet there are very few vacant dwellings in the city, and these few of the poorer class. There are over one thousand business and dwelling houses in the city.

The assessed valuation of the city in eighteen hundred and seventy-four was one million three hundred and eighty-nine thousand two hundred and eight dollars. As there was no separate city assessment until eighteen hundred and seventy-two, there are no figures on which to base a comparison prior to that time, but as the land on which a large proportion of the above assessment was levied was sold in eighteen hundred and sixty-seven for about four hundred dollars, it will be seen that the increase in actual wealth must have been very rapid.

CITY PUBLIC SCHOOLS.

The city is divided into three school districts.

San Diego District (Old Town) has the best school building in the county—a good two-story building. Teachers—Miss Honora Carroll, Grammar Department; Miss Kate Carroll, Primary Department. Total

children between five and seventeen, two hundred and seventy-eight; total scholars on the roll, ninety-three; average number belonging, sixty-eight.

New San Diego District has four one-story buildings, corner of Sixth and B streets. Teachers—Grammar Department, Charles Coleman, Jr.; Intermediate, Miss Belle S. Nash; Second Primary, Mrs. Ellen A. Bush; First Primary, Miss Carrie A. Parks. Total children between five and seventeen, four hundred and fifty-seven; total scholars on the roll, two hundred and fifty-one; average number belonging, one hundred and eighty-one.

East San Diego District has a small, neat building, located in Sherman's Addition. Miss Lizzie Goudy, teacher. Total children between five and seventeen, eighty-nine; total scholars on the roll, thirty; average number belonging, twenty-three.

CHURCHES.

Church of the Immaculate Conception (Roman Catholic), Old Town; Rev. A. D. Ubach, pastor; Rev. Hugh McNamee, curate; congregation nearly four hundred. The society in New Town, numbering about six hundred, are now erecting a church corner of Fourth and Cedar streets. Services now held in Rosarie Hall, F street.

Methodist Episcopal Church, corner Fourth and D streets. Rev. Geo. S. Hickey, A. M., pastor; organized May eighteenth, eighteen hundred and sixty-nine; church built in eighteen hundred and seventy, with seating accommodation for two hundred and fifty; number of members, seventy-five; value of church property, six thousand dollars.

First Baptist Church, corner of Seventh and F streets; Rev. O. W. Gates, pastor; organized June fifth, eighteen hundred and sixty-nine; church built in eighteen hundred and sixty-nine, with seating accommodation for two hundred; number of members, sixty-seven; value of church property, five thousand dollars.

First Presbyterian Church, Eighth street, between D and E; Rev. F. L. Nash, pastor; organized June ninth, eighteen hundred and sixty-nine; church built in eighteen hundred and seventy-one, with seating accommodation for one hundred and seventy-five; number of members, eighty; value of church property, three thousand dollars.

Church of the Holy Trinity (Episcopal), corner of Fourth and C streets; Rev. Hobart Chetwood, rector; organized April sixth, eighteen hundred and seventy; church built in eighteen hundred and seventy, with seating accommodation for one hundred and fifty; number of communicants, sixty; value of church property, two thousand seven hundred and fifty dollars.

Unity Society for religious, moral, and intellectual culture. No resident pastor. Sunday School at Horton's Hall.

BANKS.

The Bank of San Diego was organized in May, eighteen hundred and seventy. Banking house on Sixth street, between G and H. Capital, two hundred thousand dollars; paid up, sixty-three thousand dollars. President, Thos. L. Nesmith; Cashier, Charles H. Hubbell.

The Commercial Bank of San Diego was organized in October, eigh-

teen hundred and seventy-two. Banking house, corner of Fifth and G streets. Capital, two hundred thousand dollars; paid up, fifty thousand dollars. President, A. H. Wilcox; Cashier, E. F. Spence; Assistant Cashier, Jose G. Estudillo.

MANUFACTORIES.

The manufacturing interests are fairly represented, there being a good steam flouring mill, three steam planing mills, a machine shop, an iron foundry, two brickyards, a stoneyard, three furniture manufactories, two salt works, two soap factories, and two breweries.

These are mostly doing a good business. The flouring mill is capable of turning out one hundred barrels of flour per day, the citizens generally preferring it to any other brand. The planing mills are all fitted up with machinery for working up beehive lumber, and are crowded to their utmost with that kind of work, two hundred and fifty-five thousand feet of lumber having already been sold from the yard this Fall to be worked up for the coming season. The foundry has turned out some superior castings for buildings and for machinery at the mines, the sand here being peculiarly adapted for fine castings. Granite of an excellent quality has been found within a few miles of the city, and specimens sent to San Francisco with satisfactory results. The amount of capital necessary to make it a profitable shipping article has been wanting, and beyond supplying the local demand little has been done with it. There is also very fine stone on the Coronada Islands, but it being on Mexican territory, the duties have prevented these quarries being extensively worked.

Besides that already done, there is a wide field open for a great variety of manufactories. Large sums are sent away every year for manufactured goods, the raw material for which is produced here. The wool supply, reaching at this time into the millions of pounds annually, is all sent away to be returned in manufactured articles. An establishment for the manufacture of woolen goods would prove very profitable, the cost of running machinery here not being much greater than in the East, and any additional expense would be much more than repaid in the saving of freights and the general increase of business. The manufacture of leather and boots and shoes would also prove remunerative. Within a short distance of the city are large quantities of live oak and sumac for tanning purposes, and the large number of hides annually shipped from here, if made into boots and shoes, would add to the value of the export list. There is scarcely a manufacturing interest that would not pay well here—the market is extensive and yearly extending. Farming implements of all kinds are in demand, many of which could be manufactured here profitably. During the past year there has been sold in this market one hundred and forty-five Mitchell wagons, besides a large number from other manufactories, and quite a large number made here.

Nearly all branches of business and professions are represented. In addition to the manufactures, there are twelve dealers in general merchandise, three drygoods, two groceries, three furniture stores, one fancy articles, three jewelers, one book store, three milliners, four drug stores, one builders' goods, four tin and stove stores, five fruit stores, one commission house, two wholesale liquor houses, two lumber yards, two bakeries, one bookbindery, six blacksmith and wagon shops, two harness shops, two livery stables, two boot and shoe stores and several

boot and shoe shops, eighteen lawyers, twelve physicians, and two dentists.

HEALTH REPORT.

That San Diego possesses the most healthy climate in the world her mortuary reports fully prove, while the tables of temperature show conclusively that it has the most equable climate in this or any other country. Extremes of heat and cold are unknown, the temperature never falling to freezing point, and the annual range being only about forty-five degrees. The sweltering heats, so debilitating to invalids, are avoided. The prevailing winds of Summer are from the west and northwest, by which the heat is modified, the temperature at the one o'clock and fifty five minutes P. M. observations ranging at about seventy to seventy five degrees, seldom reaching eighty degrees, and in the four years the record has been kept, in only one instance has it reached ninety degrees.

During eighteen hundred and seventy-three, the rainfall was 12.99 inches, while the entire number of days on which rain fell was only thirty-one. The rainy season usually commences in November and continues until March, and during those five months in eighteen hundred and seventy-three–four, the rainfall was 14.27 inches, and the days on which rain fell forty, while the monthly mean of relative humidity for the same time was from seventy-five to eighty.

From the report of the observer of United States Signal Service for the year eighteen hundred and seventy-four, we make the following extracts, carried up to the twentieth of December:

Months.	Barometer.				Thermometer.				Mean Humidity.	Rainfall.	
	Mean	Range.			Mean	Range.				Amount in inches	No. days on which rain fell
		Highest	Lowest	Difference		Maximum	Minimum	Difference			
January	30.08	30.31	29.92	.39	54	71	42	29	80	3.11	7
February	30.09	30.28	29.75	.53	52	64	41	23	82	3.73	11
March	30.08	30.22	29.88	.34	52	63	41	22	75	1.20	10
April	30.08	30.24	29.82	.42	56	71	43	28	70	.35	3
May	29.98	30.14	29.86	.28	61	74	50	24	75	.32	5
June	29.94	30.06	29.81	.25	63	74	55	19	76	.00	0
July	29.96	30.11	29.81	.30	69	78	60	18	78	.12	3
August	29.94	30.07	29.82	.25	68	83	56	27	78	.00	0
September	29.90	30.07	29.74	.33	65	78	56	22	80	.04	3
October	30.02	30.23	29.88	.35	62	90	46	44	74	.53	7
November	30.06	30.30	29.88	.42	66	75	45	30	78	.88	5
December	30.14	30.30	29.99	.31	55	82	39	43	63	.00	0
Yearly mean	30.02	30.19	29.85	.34	62	75	48	27	76	10.28	54

The greatest desideratum in the location of a sanitarium should be a freedom from sudden changes, from extremes of temperature, from chilling winds, from disagreeable fogs, and from a humid atmosphere—all of which requisites are possessed by this place. During the middle of the day, when the sun's rays are the fiercest, the air is tempered by the sea breeze, which falls towards sunset, thus equalizing the temperature, as will be seen from the fact that in the yearly mean for eighteen hundred and seventy-three, there is but eight degrees difference in the temperature between the morning, noon, and night observations, while the changes, for either of the three observations, between any two consecutive days, is generally not more than one or two degrees, and seldom, if ever, more than six or eight.

During the past four years much has been said and written by those competent to form a correct opinion in reference to this place in a sanitary point, and the universal verdict is, that it has no superior. The late Professor Agassiz, whose scientific attainments command the admiration of the world, after spending some time here, paid this tribute to the location, at a public meeting:

"There is one advantage that I have failed to hear the distinguished speaker who has preceded me allude to. I, as a scientific man, may lay more stress on it than necessary, but I hardly think it possible. It is the question of latitude that I refer to. You are here on the thirty-second parallel of latitude, beyond the reach of the severe Winters of the higher latitudes. This is your capital, and it is worth millions to you."

In the *Overland Monthly*, in eighteen hundred and seventy, the Rev. Mr. Cronell thus speaks of the climate: "The atmosphere is dry, clear, and invigorating. No dense fogs, as at San Francisco, obscure the Italian transparency. Already San Diego is being sought solely to gain relief from present ills, and secure an extra lease of life. Undoubtedly it will become historic as the place of all others on this coast, which, with healing in its wings, bears up worn-out human nature, bringing to the invalid's cheek a flush of hope as it greets him with its bright, sunny smile."

The total deaths in the county for eleven months ending December first, eighteen hundred and seventy-four, was only forty-two, being an annual rate of 4.59 deaths per one thousand on the entire population of the county. When this is compared with New York, with 32.64 deaths per one thousand; Boston, 30.53; Philadelphia, 26.28; St. Louis, 23.02; Chicago, 27.60; San Francisco, 17.50, as reported by them in eighteen hundred and seventy-two, it justifies the assertion of the healthfulness of this climate.

MISCELLANEOUS.

The facilities for travel from here are good. There are two lines of steamers between here and San Francisco, with a steamer by each line once in six days. By the Panama line of the Pacific Mail Steamship Company there is also a steamer each way every fourteen days. Stages leave daily via Los Angeles, making time to San Francisco in sixty hours. For Julian, and also for Arizona, stages leave three times a week. On the latter line time has been reduced to five days to Tucson and eight to Mesilla. Stages for San Bernardino once a week.

The mails are carried on all the stage lines. In no one thing, perhaps, is the progress of the place more apparent than in the Post Office statistics. This office was established in eighteen hundred and sixty-nine, as

a fifth class office, with a salary of twelve dollars per year. It has steadily increased until now it is second class, with a salary of two thousand six hundred dollars. During eighteen hundred and seventy-four, there has been received over thirty-six thousand letters, and a larger number sent out, while the newspapers received are about one hundred and four thousand. The money orders issued have been four thousand seven hundred and eighty-four.

Besides manufactures, there are numerous industries that might be profitably developed here, and none more so than that of sericulture. Wherever sericulture has been tried in the State, the most satisfactory results have been in those localities where the soil in which the mulberry tree is cultivated was the driest, and for that reason it is urged that this may prove a very valuable industry in this section. The tree grows well with little care, and the dry, even temperature would save the silkworms from many of the diseases to which they are subject where rainy seasons prevail, or where the soil is such as to produce an undue proportion of sap in the growing tree, which is almost certain destruction to feeding worms.

The most extensive practical experiments made in fruit culture in the city, has been by Colonel George Stone, in the southeast part of the city, where he has ten acres, planted four years ago, and where the past season he has had a large variety of semi-tropical fruits. He has eight hundred fruit and nut trees, and six hundred ornamental trees, all thrifty, and those in bearing, very prolific. He has a few bearing guavas, from which he has manufactured the best of jelly, and intends making these a leading growth, believing them to be one of the most profitable of fruits. He has also in bearing lemons, limes, almonds, figs, Italian and Spanish chestnuts, and a large variety of fruits of the temperate clime.

Adjoining the city on the south is the National Rancho, having a frontage of six miles on the bay, largely owned by Kimball Brothers. They have also laid out National City, and made considerable improvements. The rancho includes Sweetwater and Paradise Valleys, where extensive experiments have been made in fruit culture, both in the valley and on the mesa, and the result has been highly satisfactory.

The settlement of this city has been largely by people of high moral worth, refinement, and intelligence, and no place stands higher morally than this. The freedom of the streets from broils and attendant exciting scenes incident to new towns, has been favorably noted and commented on by those visiting here.

On the whole we know of no place where the present advantages and the future prospects offer better inducements for investment, permanent location, or for those seeking a mild, healthful climate.

INDUSTRIAL SURVEY OF SONOMA COUNTY.

ITS TOPOGRAPHY—VALLEYS—WATERCOURSES—MOUNTAINS—MINES—TIMBER—AGRICULTURE—RAILROADS—TOWNSHIP SUBDIVISIONS—ITS RESOURCES GENERALLY.

BY R. A. THOMPSON, OF SONOMA COUNTY.

A BRIEF HISTORICAL SKETCH.

The first settlement made inside of the present limits of Sonoma County was in eighteen hundred and twelve, by the Russians, from Alaska. They occupied the Bay of Bodega and the surrounding country, trapping along the coast, in the Bay of San Francisco, and on the interior streams. At the same time they raised grain in the Bodega country to supply their colony in Sitka. In eighteen hundred and forty-one they abandoned the country.

The Mission at Sonoma was founded August twenty-fifth, eighteen hundred and twenty-three. In eighteen hundred and thirty four, there were one thousand three hundred Indians at the Mission, three thousand head of cattle, seven hundred horses, and four thousand head of sheep. About this time the decree of the Mexican Government was passed liberating the Indians, and the downfall of the Mission soon followed.

In eighteen hundred and thirty six, the Californians declared their independence of Mexico. Alvarado was elected Governor, and General M. G. Vallejo was made military commandante, with headquarters in Sonoma, at which place he continued to reside until the occupation of the country by the Americans. On the thirteenth of June, eighteen hundred and forty-six, thirty-three Americans took possession of the Town of Sonoma and the person of General Vallejo, raised the bear flag, which was soon after superseded by the American colors, and the Territory of California became a part of the great republic.

For some time after this event Sonoma was occupied as a military post, an Alcalde being the only civil officer. After the adoption of the State Constitution, the first members of the Assembly and Senate were chosen to the Legislature, which met at San Jose on the fifteenth of December, eighteen hundred and forty-nine. Sonoma District then embraced all the territory west of the Sacramento River and north of the Bay of San Francisco. The entire vote for the Senate was only six hundred and twenty-three, divided as follows: M. G. Vallejo, one hundred and ninety-nine; J. P. Walker, one hundred and sixty-eight; S. Cooper, forty-nine; Jonas Spect, one hundred and forty-nine; scatter-

ing, fifty-eight. Hon. John S. Bradford, now of Springfield, Illinois, was elected to the Assembly. At this session, Sonoma County was organized, and included the whole of the County of Mendocino. The county seat was at the Town of Sonoma. Following were the names of the first officers: Robert Hopkins, District Judge; H. A. Green, County Judge; Israel Brockman, Sheriff; R. B. Butler, Clerk; R. A. Maupin, District Attorney.

In eighteen hundred and fifty-nine, Mendocino was segregated and the present boundaries of this county were established. It is fifty-five miles long by an average width of twenty-five miles, comprising an area of about eight hundred and fifty thousand acres. Its western boundary is the Pacific Ocean. Its southern boundary is partly Marin County, and partly the Bay of San Pablo. On the east it is bounded by the Counties of Napa and Lake, on the north by Mendocino.

ITS TOPOGRAPHY.

Sonoma County, as we have said above, is bounded on the west by the Pacific Ocean. The land along the shore is not rugged. It produces natural grasses, and may be cultivated almost to the water's edge. The hills along the coast are open and rolling, upon which the sea fog keeps vegetation green the year round. As a grazing and dairy country it cannot be surpassed. The soil is sandy and of unusual depth. The hills, where not used for grazing, are cultivated in potatoes or oats, for which the soil seems to be especially adapted. This section is known as the Bodega country, named from Bodega Bay, a shipping point which affords safe anchorage for vessels of considerable size. The principal products of the Bodega country are potatoes, oats, butter, cheese, poultry, and eggs. As in all other countries where dairy products are a specialty, the people are prosperous, and have coin ahead.

THE LUMBER DISTRICT.

North of this dairy section, which embraces about one half of the coast line of the county, the hills are heavily timbered with redwood. This magnificent tree grows along the coast as far inland as the influence of the sea fog extends, upon which it seems partly to depend for moisture and a vigorous growth. There is no finer sight than a fog creeping through a forest of redwoods. The trees grow straight for hundreds of feet, and then branch out in the sunlight; the fog seems to entangle itself in the foliage, and the spongy leaflets absorb the grateful moisture. The timber belt of Bodega extends north of Bodega Bay for about thirty-five miles, and inland for about fifteen miles. It embraces not less than one hundred and fifty-four square miles of timber land, which will cut, at the lowest estimate, two hundred and fifty thousand feet of clear lumber to the mile, leaving enough standing for fuel, fencing, railroad ties, etc., for a hundred years to come; besides hundreds of acres of oak timber, which produces tan bark, and the raw material for charcoal, of which a great supply is made in this county for the San Francisco market. There are a number of mills along the coast which manufacture lumber and ship direct to the San Francisco market in small vessels, which are loaded at the mills without danger, except during heavy storms.

RUSSIAN RIVER.

The principal stream in the county is Russian River—not navigable. It enters the county on the north, flows southeasterly for twenty miles, and then turns to the west, enters the timber belt, and forces its way through the coast hills to the ocean. The timber along the Russian River bottom is not surpassed on this coast. Half a million feet of clear lumber has been cut from a single acre in this section; from mills along the eastern slope of the coast hills our local supply of lumber is obtained, while that upon the sea face of the hills is exported to the San Francisco market.

THE GREAT VALLEYS.

We will now leave the coast country. The chief topographical features of Sonoma County are a number of magnificent valleys, which include in their boundaries every variety of soil, climate, and product known to the Pacific Coast, from the great staples of the Mississippi Valley to the semi-tropical products of Florida. These principal valleys are (in order southward to San Pablo Bay, across which it is but thirty miles to San Francisco), Russian River, Santa Rosa, Sonoma, and Petaluma. There are a number of small valleys which are feeders to the large districts. In each section named there is a considerable town, of which more will be said.

RUSSIAN RIVER VALLEY.

Russian River Valley, the first in order, includes the rich bottom lands along which the river flows, between the Mayacamas range of mountains on the east, and the coast hills, which we have described, on the west. The valley is but a few miles wide where the river enters the county. It extends with the river for twenty miles in a southeasterly direction, widening gradually. The river then turns west to the sea, and the valley opens on the broad and fertile plains of Santa Rosa, which extend southward some twenty miles further. The watershed from these plains is northward to Russian River, and the rise is so gradual that it is imperceptible to the eye. The bottom lands of Russian River are as fertile as the delta of the Nile. The soil is alluvial, of great depth, almost annually fertilized by the overflow of the river. Corn, wheat, beans, and vegetables grow with extraordinary vigor. The bottoms are especially adapted to the growth of hops, though they are not generally grown. The lands back of the river bottoms produce grain, grapes, and fruit. The higher hills are used as pastures.

Healdsburg is the largest town in the valley. It is situated on the line of the San Francisco and North Pacific Railroad; has many advantages for manufacturing, and commands a considerable trade with the neighboring mines and rich farming land in its vicinity. The population is about one thousand four hundred. For beauty of surroundings and salubrity of climate, it cannot be surpassed. It needs only population and capital.

Dry Creek Valley, west of Russian River, embraces a tract of very fertile land. It is one of the feeders of Healdsburg. East of the town lies Alexander Valley, which also contains considerable farming population. Cloverdale, in the head of the valley, is the northern terminus

of the railroad, of which a description appears elsewhere. Midway between Healdsburg and Cloverdale, on the line of the road, is the Town of Geyserville.

SANTA ROSA VALLEY.

From Russian River, southward, the plains of Santa Rosa rise gradually for sixteen miles. There is just slope enough to turn the water back to the river. The plains are about twelve miles square, in the center of the county. Two large streams flow from the mountains on the east across the plains into a series of lakes on the west, which are drained into Russian River. Clusters of oaks grow on the plain, not close enough to impede cultivation, giving a pleasing effect to the landscape. Besides the staple products, all seed and stone fruits, such as apples, pears, plums, prunes, cherries, and peaches, grow in the greatest perfection. On the thin lands, and on the foothills, the grape finds a natural home, producing this season as much as ten tons to the acre in some instances. The average yield is about four tons to the acre, worth at the wine factories twenty dollars per ton. On the eastern slope of the valley, near the foothills, the Town of Santa Rosa is beautifully situated. It is built along the banks of the creek of the same name, around a public square, in the center of which there is a grove of native oaks. A writer in the *Country Gentleman*, now a resident of the place, said elegantly of this square: "That it was like the title page to a good book—an index of the surrounding country." Bennett Valley, the Guilucos, and the Rincon, are valleys near the Town of Santa Rosa, each peopled by a thriving and industrious farming population. The surrounding scenery is beautified by the tall peaks of the Mayacamas range on the east, the boldest of which are St. Helena and the Guilucos Mountains, by the Sonoma Mountain on the southeast, and by the immediate Coast Range on the west, fringed with its growth of redwoods, through which the sea breeze sifts and comes hitherward shorn of its harshness.

PETALUMA VALLEY

Lies south of Santa Rosa, from which it is separated by a scarcely perceptible watershed. An arm of the bay divides this valley. At the head of navigation on this estuary the Town of Petaluma is situated. The valley is about fifteen miles long, with an average width of seven to eight miles. All the cereals are produced and fruits grow in great abundance. Prior to the building of the railroad the products of the county were hauled to Petaluma and shipped from there by steamers and sailing vessels to San Francisco. There are many finely improved farms and good farmers in the Valley of Petaluma, and its accessibility to San Francisco by water, the distance being not over fifty miles, insures cheap freights for its produce. The town is a center of considerable manufacturing enterprise. As fine wagons are made here as in any part of the United States. It has tanneries, a foundry, and other factories. The people are enterprising and have at command capital which they are ready and willing to spend in the improvement of roads, and for such other purposes as will advance the interests of the place. Petaluma is the exporting point for much of the Bodega produce, and of a number of surrounding valleys.

THE RAILROAD SYSTEM.

We have now given an imperfect description of the three great central valleys of Sonoma County, extending from tide water to the northern county line, separated from each other by an unapparent rise, forming in fact a great valley fifty-five miles long, through the center of Sonoma County. Eight miles below Petaluma, on the creek, is situated the Town of Donahue. At this point there is sufficient water to admit the largest river steamers which ply upon the Bay of San Francisco. The Town of Donahue is the initial point of the San Francisco and North Pacific Railroad. The steamer for Sonoma County leaves the wharf at San Francisco at two o'clock P. M. every day, reaching Donahue at four o'clock and forty-five minutes; distance about thirty-four miles. The passengers and freight are transferred to the cars, which arrive in Petaluma at five o'clock and ten minutes; Santa Rosa, five o'clock and fifty-three minutes; Healdsburg, six o'clock and thirty-seven minutes; Cloverdale, the northern terminus, seven o'clock and twenty-five minutes. The time from San Francisco to the northern county line, passing through each of the great valleys we have described, is about five hours. Returning, the cars leave Cloverdale in the morning and the steamer arrives in San Francisco at twelve M. A new and elegant steamer is now building in San Francisco for this route, which will materially shorten the trip across the bay. Eventually, by a further extension of the railroad, the time will be shortened for the entire route to about three and a half hours. From the above our proximity to the great metropolis may be seen, and also our facilities for transporting freight and passengers, which will soon be still further improved.

SONOMA VALLEY.

We have given a descriptive account of three of the four great valleys of Sonoma County, and of the railway which binds them together as one, with a terminal point at tide water and another near the northern boundary of the county. We now come to Sonoma Valley, from which the county takes its name. It has marked peculiarities, differing from the rest of the county and State, in climate and scenery, in soil and productions. Those who have read the preceding description will understand when we say that Sonoma Valley is separated from Petaluma Valley and the plains of Santa Rosa on the east by a range of hills which rise from the marsh, on the bay shore, reaching, in a distance of fifteen miles, an altitude of twenty-three hundred and six feet. From the highest point the mountain slopes to the northward; one spur terminates in the plain near Santa Rosa, twenty-five miles north of the bay; another bears to the eastward and unites by a series of low hills with the Napa mountains, forming the northern boundary of Sonoma Valley; its western wall is the main mountain, its eastern the Napa Mountains. On the south it has a frontage of about eight miles on San Pablo Bay. A navigable estuary flows from the bay some miles inland. From the peculiar conformation of the valley it is thoroughly sheltered. The immediate sea breeze is turned by the high mountains on the west, and the breeze from the bay passes south of the Sonoma tide lands. The climate is semi-tropical. The soil and scenery, volcanic in nature and appearance, is said to resemble the great wine-producing sections of

France and Germany. In the valley wine is almost exclusively grown; year by year it improves in color, in flavor, and in popularity. The day, if not already at hand, is not far distant, when the dry wine of Sonoma may challenge comparison with the Johanisberg, Hochheimer, and other world famed brands of the Rhenish provinces. The valley and the sloping hills on either side in a few years more will be as one great vineyard. In Autumn, during the vintage, the scenery in Sonoma cannot be surpassed. The leaves on some varieties of vines turn golden yellow, on others a brilliant scarlet. This contrast with the blue and purple peculiar to all California mountains is simply gorgeous (we don't like the word but there is no other just suitable). In Sonoma Valley there are orange trees sixteen years old and twenty-four feet high, literally loaded at this time (December) with ripening fruit. Statistics of production appear elsewhere.

SONOMA MOUNTAIN.

As the traveler passes through the valley on either side of Sonoma mountain it presents a sharply defined outline along its summit. This is an optical delusion. "Distance," the poet says, "lends enchantment to the view." In this instance the poetic simile does not hold true, for the nearer you approach the summit the greater is the charm. It is, in fact, an elevated plateau or mesa, as if the plain had been pushed up so generally that the strata was undisturbed and the surface of the soil unbroken. The growth is identical with that in the valley, the spicewood, the oak, and the madrona. The grasses are the same, the wild oat, alfileria, and the clovers. Its highest point is a wheat field upon which the grain is now green. There are brooks and springs on all sides, and lakes of considerable size, on this elevated table, which is, at its greatest height, over two thousand feet above the valleys on either side. The whole length of the mountain is about twenty-five miles from its spring on the bay shore to its termination near Santa Rosa. Its average width is about eight miles from the valley on one side to the foothill on the other. Much of the land is under cultivation, and there is not an acre too steep for grazing either sheep or cattle. There is one other peculiarity of this mountain worthy of notice; no streams of any size flow from it on either side. Except in freshets but little water from this great area of upland finds its way to the plain. It absorbs the greater part of the water which falls upon it. Just opposite, on the north side of the Guilucos mountain, not much higher, three large streams arise, two of which flow across the Santa Rosa plains to the Lagoon, a tributary of Russian River, and another southward to San Pablo Bay through Sonoma Valley. Each of these streams might for half the year be classed as rivers, while from the opposite mountains there is no flow of water of sufficient volume to be classed otherwise than as a brook. The face of the Sonoma Mountain overlooking Sonoma Valley, from foothill to summit, is grape land of the choicest kind; the opposite side, facing the plains of Santa Rosa and Petaluma, is too much exposed for grapes, but is equal to any for dairying and grazing land and for seed and stone fruits.

TOWNSHIP SUBDIVISIONS.

We have given above the geographical subdivisions of Sonoma County. The county is divided into townships for official purposes. Sonoma

Township includes the valley of the same name and the eastern slope of the Sonoma Mountain. Total assessed value of property, one million eight hundred and forty-seven thousand one hundred and forty-one dollars.

VALLEJO TOWNSHIP,

Adjoining on the west, includes the west face of the mountain to the bay shore, and all the land lying east of Petaluma Creek. Vallejo Township is about fifteen miles long by an average width of about six miles—almost every acre can be cultivated. It has many dairy farms. Fruit and grain are grown in considerable quantity. Beef cattle, hogs, and sheep, are a source of large revenue to the farmers of Vallejo Township. J. R. Rose and Seneca Daniels, the oldest breeders of thoroughbred Devon cattle, have their farms in this section. Donahue, the terminus of the railroad, is in this township. The market town is Petaluma, which lies just across Petaluma Creek. A portion of the town, East Petaluma, is, in fact, in Vallejo Township. A substantial drawbridge unites the two. Total assessed value of property, six hundred and fifty-eight thousand eight hundred and ninety-eight dollars.

PETALUMA TOWNSHIP

Lies west of Vallejo, including all the territory west to the Marin County line. This township is a butter, cheese, potato, and stock producing section. In Two-Rock Valley one hundred thousand sacks of potatoes are grown. There are large herds of sheep and numbers of hogs are raised. The dairy product is also an item of great importance. Petaluma, the principal town, is a growing place. It was, formerly, the shipping point for all the produce of the county. It has extensive manufacturing interests, among which is the Central flouring mill, with a capacity for making sixty-five barrels of flour a day; it has two run of three-foot stone. The Oriental mill manufactures about four thousand barrels a year. Wagon and carriage manufacturing is carried on extensively. The largest factories are those of Zartman & Co., J. Lorrenger, Harter & Co., and Spottswood Bros. There are two tanneries; the largest owned by S. Slaver, tans two thousand five hundred hides a year. The soda factory of B. F. Connolly supplies nearly all the soda, sarsaparilla, and bottled ale and porter, used in the county. There are many other enterprises worthy of mention which the scope of this paper will not admit. The total assessed value of property, two millions nine hundred and eighty-five thousand and sixty-two dollars.

DOWNS OF SONOMA.

The country north of Petaluma Township, along the coast, includes the Townships of Analy, Bodega, part of Russian River, and part of Redwood. This section embraces a territory for which the name of the "Downs of Sonoma" would not be inappropriate. The hills are barren of trees, and are rounded, as if formed ages ago by the action of the wind before the hard crust formed over the drifting sea sands. The soil is a deep, rich sandy loam, carpeted with a heavy sward of grass, which keeps green almost all the year. Potatoes, butter, and cheese are the principal products. In the Valley of the Estero Americano, an arm of the sea, reaching about seven miles inland, one hundred thousand sacks of potatoes are raised annually; near Bodega, twenty thousand

sacks, and in Blucher Valley twelve thousand sacks. In this district there are at least eight thousand head of milch cows, which average three fourths of a pound of butter a day for seven months of the year. A little figuring will show the great income from this source. Besides this a large number of hogs are raised on the refuse from milk. Beef cattle are shipped, also hay, oats, and barley. Of the timber resources an account appears elsewhere. The towns are Bloomfield, on the Estero Americano; Valley Ford, on the same stream, nearer the sea; and Freestone, further north, are local trading towns for the convenience of neighborhood trade. Bodega Corners, about the center of this district, is a place of a large trade. It has an excellent school house, handsome churches, stores, hotels, and the usual accompaniment of shops, stables, etc. Forrestville is a small town on the route to the timber region, which owes its importance to the chair manufactory of S. S. Nowlin. The lumber used is all from the surrounding timber district which lies just north of the "Downs." The chairs made here are shipped to all parts of the State; it is a standing advertisement of the benefits of manufacturing. Guerneville is situated in a timber district, of which an account appears elsewhere. Sebastopol lies on the edge of Santa Rosa Plain, seven miles from the town, and is a small but thriving village. The country described lies between the Santa Rosa Plain and the ocean. Its furthest point is not more than twenty miles from the county seat. Great space might be profitably given to this rich section of the county.

The total assessment of Analy Township, four hundred and sixty-five thousand and twelve dollars; of Bodega Township, seven hundred and seventy-four thousand seven hundred and twenty-two dollars; of Redwood, one hundred and fifty-four thousand five hundred and forty-five dollars; of Ocean Township, one hundred and twenty-three thousand one hundred and twenty-six dollars. Salt Point Township lies north of the Bodega country, along the coast. It has some fine farms, but its principal resources are lumber, and the section will be described under another head. Fort Ross, now owned by G. W. Call, the spot settled by Europeans north of the bay, is in this township.

NORTHERN TOWNSHIPS.

Going in an easterly direction we reach the Townships of Mendocino and Washington, which include the whole of the Russian River Valley. This country as a farming section cannot be surpassed. The principal towns, Healdsburg, Geyserville, and Cloverdale, have been mentioned. The mineral section lies east of these two townships, in the main range of mountains which run through the northeast corner of the county.

The total assessed value of property in Washington Township is two hundred and twenty thousand two hundred and ninety-nine dollars; of Mendocino Township, one million seven hundred and twenty-five thousand and ninety-one dollars. Russian River Township lies south of Mendocino; it includes a large area of farming, fruit, grape, and mineral land. Windsor, the principal town, is on the line of the railroad. A great shipping business of cord-wood, charcoal, grain, and fruit is done at this point. Assessed value of all property in Russian River Township, one hundred and thirty-three thousand nine hundred and fifty-six dollars.

SANTA ROSA TOWNSHIP.

We now come to Santa Rosa Township, which has an assessed valuation of property amounting to nearly four million dollars, the largest in any of the thirteen townships in the county. It embraces a territory extending from east to west across the county for eighteen miles, with an average width of from eight to ten miles. It is in the very center of Sonoma County. The railroad crosses it from north to south. The Town of Santa Rosa, the county seat, is in the center of the township, on the line of the railroad. An hour's travel by rail brings passengers from either extreme end of the county to the capital town. Passenger trains for San Francisco arrive at Santa Rosa about eight A. M., from Cloverdale; returning, pass Santa Rosa at six thirty P. M. Freight trains, with accommodations for passengers, pass Santa Rosa, for Cloverdale, at about nine A. M.; returning, pass Santa Rosa at three P. M. The east line of the township is the divide between Napa and Sonoma Counties. These hills are well suited for grazing and the south hillsides for grape culture. Two thirds of the township lies in what is known as the plains of Santa Rosa—mostly bottom lands, which produce forty bushels of wheat to the acre—lying along Mark West and Santa Rosa Creeks, which flow from the hills west across the plain, parallel with each other and about four miles apart, to the Lagoon. For ages these streams had no well-defined channel, and year after year the Winter freshets brought down and distributed over the plain a rich tribute of alluvial and vegetable mold from the mountains. In some places the land is stratified by these yearly deposits. The periodical overflow is marked as plainly in the soil as the annual rings of the oaks which grow upon the surface. The soil is from twelve to fifteen feet deep. It rests upon a bed of gravel in which water is always found. The gravel lies on a concrete; on this concrete and through the gravel overlying it there seems to be a flow of underground water. Fruit trees, shrubbery, and roses will send their roots down to this water. Even alfalfa has been dug where its long tough root had gone from twelve to fifteen feet to the gravel strata. Wherever the roots of trees or shrubs reach the water the growth is prodigious.

Since the occupation of the plain the water from the streams has been turned in one direction until it has cut a deep channel, which now acts as a surface drain. There is no overflow except in seasons of extraordinary rains.

Immediately west of Santa Rosa Township lie the "Sonoma Downs," commencing on the edge of the plain, seven miles west of the town, extending to the ocean. Northwest about sixteen miles lies the great timber belt. North, in easy ranch, are Russian River, Mendocino, and Washington Townships. Northeast twenty-seven miles lies the great quicksilver belt. Southeast lies Sonoma Valley, and south about sixteen miles Petaluma and Vallejo Townships. The Sonoma Mountain branches about seven miles below Santa Rosa, and forms three valleys, each of which are in Santa Rosa Township, lying east and southeast, and within a few miles of the Town of Santa Rosa. In Bennett Valley there are fifty-five farms of about three hundred acres each. The Guilucos Valley is about seven miles long by an average width of about three miles. It has the finest of fruit, grape, and farm land. The scenery around the residence of William Hood, owner of the Guilucos Rancho, is considered the finest in the State. The road from Santa

Rosa to Sonoma Valley passes through the Guilucos, over rolling hills of easy grade for a wagon road or railroad. The Rincon Valley embraces about four thousand acres of very fine grape and fruit land. There are twenty-five farms in the valley. It is not more than two miles from the town. There are two other small valleys in the hills to the east, Rural and Alpine, each of which contains good farming and grazing land. In the same district in this township lies the wonderful curiosity, the petrified forest, which was visited this season by more than three thousand tourists.

Remembering the broad plains on the west, and its relative position with the rest of this great and wealthy county, some idea may be had of the future importance of the Town and Township of Santa Rosa. Its chief products are wheat, corn, wine, beef cattle, hogs, sheep, and wool. There are thousands of acres in this township suited to grape culture, and the land may be bought for from ten to twenty dollars per acre. The shipments of produce from Santa Rosa are the largest on the line of the railroad.

THE MINES OF SONOMA COUNTY.

As early as eighteen hundred and fifty-two, there were reported discoveries of gold on Russian River, in this county. About that time one of the Kelseys, pioneers in this section, led a party to the head of the stream, in the Eel River mountains. They met with no great success and returned. The reports of gold discoveries were again revived in eighteen hundred and fifty-four, but soon died out.

After the discovery and occupation of the Geyser Springs, the abundant indications of cinnabar in the vicinity attracted attention. The price of quicksilver at the time was low—fifty cents a pound; the cost of reduction was great, and the Almaden mine was producing a supply adequate to the demand. For these reasons no especial attention was paid to the indications of mercury everywhere visible on the surface near the Geysers.

In eighteen hundred and fifty-nine Colonel A. C. Godwin, then the owner of the springs, organized a mining district, located a number of claims himself, and a number of others were also taken up. These claims were afterwards consolidated into one or two companies, and some work was done upon them. The low price of quicksilver, the scarcity of labor and lack of skill in manipulating the ore, led to loss, and finally put a stop to all work on the mines. In eighteen hundred and sixty-one, Colonel Godwin, who had given the enterprise most of its life, sold his interest in the springs and mines, returned to the East, and was killed in the war between the States. The stock of the consolidated companies went to zero, and the mines were sold at Sheriff's sale to satisfy the demands of creditors. Professor Whitney, with a corps of scientists, came along soon afterward, and with his "no view theory" in the Coast Range, extinguished the last spark of life in mining enterprises in Sonoma for the time.

Meanwhile, the developments in the silver regions of Nevada, in the quartz and gravel mines of California, caused an increased demand for quicksilver. The diminished supply afforded by the Almaden Company, which had passed its maximum production, gave a further stimulus to the price, and attention was again called to the indications in this section, which had not been worked successfully at the old prices.

The mountain range in which most of the mines of Sonoma County

are located is known as the Mount Diablo Range. Just west of the peak from which the range takes its name, lie the Straits of Carquinez, through which the waters of the Sacramento and San Joaquin force their way and enter the Bay of San Pablo. West of the Straits the mountains trend to the northwest, gradually increasing in altitude. They form the watershed between the Sacramento and the valleys west of it to the Pacific Ocean. Napa Valley lies between the main range and a spur from it terminating on San Pablo Bay. The great valleys of Sonoma County are formed by another spur from the same range, terminating on San Pablo Bay at a point further west. This last spur forks and forms two valleys, Sonoma and Petaluma, both with a delta and frontage on the Bay of San Pablo. All these spurs unite with the main range, which then passes through the northeastern corner of this county. At or near this point of intersection a rich body of quicksilver is now being developed, a deposit which bids fair to equal if not surpass the greatest in either the old or new world.

A number of mines had been opened and successfully worked in the main range southeast of where it enters Sonoma County. Prospectors traced the croppings of the ledges along the range into this county. Granville and Green Thompson located a claim in eighteen hundred and seventy-two. They discovered large deposits of float ore and took up a claim called the Sonoma. This claim was sold to a San Francisco firm who immediately built a furnace and, by November of the same year, were reducing metal. The mine has been worked steadily, yielding a regular monthly supply of quicksilver. An excitement followed; a great number of claims were located and rich discoveries were made. A mining town sprang up, and Sonoma County, which had long ranked as one of the finest agricultural counties in the State, was discovered to have a mining interest second only to her great wealth in wine, wool, fruit, dairy products, and wheat.

This mineral district is located in the northeastern corner of the county, in the hills forming the eastern boundary of upper Russian River Valley. They are about fifteen miles from Healdsburg and twenty-seven from Santa Rosa. The mountain district in which they are located is about twenty miles long by an average width of about ten miles, including the main range and the spurs from it. Two bold streams rise in the main range. They flow in a northwest direction, with the trend of the mountains, on either side of an immense spur from the main range, unite and empty into Russian River, near the northern boundary line of the county. The highest point in this spur is Geyser Mountain, a rounded and beautiful peak, visible from all parts of the great valleys of Sonoma. It takes its name from the famous Geyser Springs, which send up their wonderful columns of steam from a deep gorge, of which this spur is the western wall. In this range are located some very valuable mines. Among the most prominent are the Socrates, the Flagstaff, the Sonoma, the Anna Belcher, the Rattlesnake, the Missouri, the Oakland, and the Geyser. We mention these as they are productive—all having furnaces now running, or about to commence—and with no desire to draw invidious comparisons or to disparage other claims. There is one peculiarity worthy of mention: those mines nearest the Geyser steam springs produce free mercury, the Socrates, the Flagstaff, and the Rattlesnake; while those further distant produce cinnabar, which is a combination of mercury and sulphur. It is not improbable that the mines will yield during the coming Summer from one thousand to one thousand five hundred flasks of metal a month, worth

one hundred dollars a flask. To W. A. Stuart, an enterprising merchant of San Francisco, the development of the mines in this section of the county is mainly due. He has sound judgment, untiring energy, and, above all, had confidence in the wealth of the district, risking time, money, and labor when others were indifferent or skeptical. It is estimated that there are a thousand people in the district. A network of good roads run throughout, and the busy din of industry and life is heard where two years ago the only trail was that of the grizzly, and the only sound the report of the woodman's rifle.

Further north there are other mines; one, the Cloverdale, is erecting a furnace, with a hillside for a mine, through which mercury seems to be evenly and thoroughly diffused. The hill has the appearance of an extinct geyser. A few miles lower, on Big Sulphur Creek, the Livermore mine is erecting a furnace.

THE GUERNEVILLE MINING DISTRICT.

We have mentioned that Russian River broke the immediate Coast Range, emptying into the sea. In this section there are a number of valuable mines. The Mount Jackson and the Great Eastern are both building furnaces. The indications of a large and lasting deposit are very favorable. Many believe that they will equal, if not surpass, the mines in the Pine Flat District. They were only discovered during the past Spring. As far as work has been done the indications are favorable, both mines having rich ore on the dump waiting for the completion of reduction works. In the same section a rich copper mine, the Olive, is now being worked.

In the vicinity of Cloverdale a chrome iron mine is worked, and regular shipments of ore are made. Of this valuable metal there is an inexhaustible supply in Sonoma County. Quicksilver mines are also being worked in the same vicinity. Our mineral wealth is in the infancy of its development. The day may not be distant when Sonoma will rank as a mining county as high as she now does for her varied agricultural resources.

REDWOODS OF SONOMA COUNTY.

THEIR GEOGRAPHICAL POSITION—ESTIMATED SUPPLY—CAPACITY OF MILLS.

The redwood is second only to the giant pines of the Sierra Nevada. As a wood of commerce it has no equal on the coast. The largest trees are fifty feet in circumference, growing to a great height with scarcely a perceptable diminution in size, often two hundred and fifty feet without branches, attaining a total height of from three hundred and fifty to four hundred feet. They stand in a forest like wooden columns, so densely shaded that no shrubbery, or small trees, grow between. In this gloom of shade and stillness one may realize something of the feeling which led the Druids of old to consecrate their groves. The great redwood timber belt of this State extends from Humboldt County through Mendocino into Sonoma, where it terminates on the edge of the open lands which we have described as the Sonoma Downs. Crossing this gap we come to a detached forest in Marin County. There was

another, long since cut out, in the hills back of Oakland. South of San Francisco, in Santa Cruz County, there is a forest of considerable extent; south of that the redwood does not flourish. To give the reader some idea of the lumber resources north of us we quote from an intelligent correspondent of the *Humboldt Times:*

"It is safe to say that Eel River has at least one hundred thousand acres of as good redwood timber as the world has produced. From careful estimates, and conversation with those most thoroughly acquainted with that locality, I fear no contradiction when I say that an average of eight hundred thousand feet to the acre can be cut from these lands. When a person stops a moment, and tries to comprehend the magnitude of these figures, he is lost in a world of calculation. Here we have one hundred thousand feet to the acre, giving in the aggregate eighty billion feet on the tract. Now, it would take one sawmill, with a cutting capacity of forty thousand feet per day, six thousand three hundred and eighty-nine years to exhaust the supply, or it would take twenty mills of like capacity over three hundred and nineteen years to effect the same result, and so on down. The cutting capacity of all the mills on Humboldt Bay is, I believe, forty million feet per year. At this rate it would take them two thousand years to exhaust the Eel River timber belt. On Van Dusen Creek, fifteen thousand acres, which will cut six hundred thousand feet to the acre. On Salmon Creek twenty thousand, which will average eight hundred thousand; on Elk River thirty five thousand, with six hundred thousand to the acre; on Mad River and Century Creek, one hundred and fifty thousand acres, nine hundred thousand feet; from Little River to the Lagoon, two hundred and fifty thousand acres, one hundred thousand feet to the acre; Eureka, Ryan's Slough, Jacoby Creek, and the forests, one hundred and five thousand acres, containing two hundred thousand feet to the acre; adding the amounts together gives a total of four hundred and forty-seven billion feet. Using the same illustration as previously named to show what these figures mean, namely: that the capacity of the present mills on Humboldt Bay is forty millions of feet per year, it will require eleven thousand seven hundred and forty-five years, at the present rate of consumption, to exhaust the redwoods of Humboldt County."

This timber belt extends in one grand unbroken forest from Humboldt through Mendocino County, and thirty-five miles into Sonoma. Of the Sonoma timber we now propose to speak—a description of the county without the redwoods and its fellows of the forest, the laurel and the oak, would be incomplete. Entering the county on the north, in Salt Point Township, it is estimated that there is twenty thousand acres of timber, a large part of which will cut half a million feet to the acre. This section extends from the north county line along the coast, and back of it for some miles into the hills. In this section there are five steam sawmills: first, the Gualalla mill, lying across the boundary, in Mendocino, but the timber is mostly in this county. Capacity of mill, twenty-five thousand feet a day. Fifteen miles below, at Fisherman's Bay, is the Platt mill, with a capacity of twenty thousand feet a day; in the same place is the Clipper steam mill, with a capacity for cutting twenty-five thousand feet a day. Four miles below Helmke's mill is situated, with a cutting capacity of sixteen thousand feet a day. Ten miles below, at Timber Cove, Miller's mill has a capacity of eighteen

thousand. This brings us to Russian River. All the mills mentioned are on or near the coast, and ship direct to San Francisco. There is, as we said above, twenty thousand acres in this district, besides an inexhaustible supply of picket, railroad, fuel, and fencing timber. It is the coast face of the hills separating the valleys we have described from the ocean. We now come to Ocean Township, and the timber on Russian River, which those who have read the preceding description will remember, flows through the valleys, and enters the coast hills, flowing through them to the sea. Just at the mouth of the river, Duncan's mill is situated. It has a capacity for twenty five thousand feet a day, has a steam railway leading from the mill to the logging camp, and from mill to shipping point. A steam launch is being constructed to carry the lumber of this mill exclusively to San Francisco. This is one of the best appointed lumber manufactories in the county. It is twenty-seven miles from Santa Rosa. South of Duncan's we come upon the open country.

We will now cross to the lumber district from which our local supply is obtained. Russian River, after leaving the Santa Rosa plain, flows through the finest of bottom land, which was heavily set with an enormous growth of redwood. The hills north and south of the river are covered with fine bodies of timber. These hills overlook the great valleys of Sonoma County, and are easy of access from them. For convenience we will divide this district into two sections; one south and the other north of the river. South of the river it is estimated that there are eight thousand acres of timber, which will cut, some portions, as high as one hundred thousand feet to the acre, and others fifty thousand and less. Those who know the country say that twenty thousand would be an average all through. There is, besides, an inexhaustible supply of oak, furnishing tan bark and fuel; also laurel, for fancy cabinet-ware, and shoe-last and stave timber. The average distance of this district from Santa Rosa is about sixteen miles. Following are the mills in this section: Ben. Joy's, capacity twelve thousand feet a day; J. K. Smith's, capacity twelve thousand; Meeker Bros., capacity twelve thousand; Frank Gilford's mill, capacity about four thousand feet per day. In this district is situated the Town of Forrestville and the chair factory of S. S. Nowlin, for which all the material is procured in the vicinity. North of Russian River the stirring lumber manufacturing town of Guerneville is situated; it is about twenty miles from Santa Rosa, in what was known as the Big Bottom of Russian River, a body of timber as fine as any in the State. At the head of this valley are located the quicksilver mines of which we have spoken. Heald & Guerne's mill is at Guerneville; it is supplied with all the requisite machinery for turning out ornamental building material of the latest styles and patterns. One of the owners, T. J. Heald, is an old pioneer, belonging to the family from whom Healdsburg takes its name. The capacity of the mill is twenty thousand feet of rough lumber a day. They make also about three hundred thousand shingles a year. Close by is the mill of Murphy Bros., with a capacity of twenty-five thousand a day. A writer in the *Country Gentleman*, who visited this mill, writes as follows of the timber, which had to be carefully felled to miss the buildings:

"There were thirteen logs in a tree, each sixteen feet long. Another tree measured two hundred and eighty-eight feet from the stump to the end of the last sawlog. It had cut fifty-three thousand feet of boards; the top was left at four feet diameter, and near one hundred feet in

length. Still another, which they were working into shingles, had already made three hundred thousand, and enough lay there in the log to make one hundred thousand more. It was perfectly free from knots and windshakes for two hundred feet. They count, usually, on having first-class clear lumber from the first one hundred and fifty feet. We measured two large trees, standing within fifty feet of each other, which were forty-one feet six inches, and forty-one feet, respectively, in circumference, at five feet from the ground."

The mill of Korbel Bros., in the same vicinity, cuts twenty thousand feet a day. The proprietors have a large manufacturing establishment in Santa Rosa for all kinds of building, ornamental, and fancy work, to which they intend at an early day to add a wine cask factory, the casks to be made of selected timber from their mill. They have about twenty-five thousand acres of land. Hassett & Mead's mill is in the same locality; it has a capacity of from fifteen thousand to twenty thousand feet a day, with about one hundred and sixty acres of timber land. There is another small water mill, Olmstead's, in this district, with a capacity of five thousand feet a day. Following are the wages paid: Sawyers receive one hundred dollars per month; engineers, fifty dollars; axemen, from thirty to fifty dollars; teamsters, seventy-five; all with board, and are paid in coin. The cutting capacity of all the mills in the county is two hundred and one thousand feet a day.

RECAPITULATION.

A well-posted lumberman gives the following statement of timber within the county limits, by districts:

	Feet.
Heald & Guerne	30,000,000
Korbel Bros	30,000,000
Murphy Bros	30,000,000
Hassett & Mead	8,000,000
Armstrong & Estep	12,000,000
Dutch John	5,000,000
Henry Willetts	6,000,000
Marshall (Mill Creek)	10,000,000
Beaver	5,000,000
Torrence	5,000,000
Other owners	30,000,000
	169,000,000
Coast, from Duncan's northward	800,000,000
Bodega Township	141,000,000
Total timber in county	1,130,000,000

GRAPE CULTURE AND WINE MAKING IN SONOMA.

The business of raising grapes and making wine has already become one of the important industries of Sonoma County. We have a large area of land fit for nothing else, but excellent for this. Such lands unimproved, within three to seven miles from Santa Rosa, can be bought from eight to thirty dollars per acre. Farms tolerably well improved with buildings, fences, orchards, and some vines, within the same radius, can be bought from thirty to one hundred dollars per acre, according to location, improvements, etc. A vineyard for profit should contain forty acres, and two men with two horses and two plows, can cultivate that amount. Fencing in this valley costs about four hundred and fifty dollars per mile. Plowing, to prepare the ground for the cuttings, costs three dollars per acre. On the steep hillsides, where the lands are low in price, it would cost, perhaps, five dollars, and from ten to fifteen dollars to grub and gather the stones so that it could be plowed. Harrowing, one dollar and fifty cents; laying off, two dollars; digging holes, three dollars per acre; cuttings can be had for nothing; planting costs from three to five dollars. The cultivation the first year, suckering, plowing, and harrowing, from three to four dollars; second year, pruning, taking away brush, plowing, harrowing, and suckering, ten dollars; third year, pruning, suckering, plowing, etc., sixteen dollars. This year the crop will average ten dollars, or half a ton to the acre. In the fourth year the vines should pay a profit, and they will if properly managed—one and a half tons to the acre, the fourth year, is not too much to expect. The picking and hauling are to be added to the expense of the previous years, but a handsome profit will be left after paying expenses. The fifth year the vines ought to yield three tons, and after that from four to five tons to the acre.

The grapes sell at the wine cellars for from twenty to thirty dollars a ton, according to condition and variety. Most farmers sell their grapes, though some of them make them into wine and brandy. If the farmer makes wine it involves an expenditure of some three thousand dollars, for cellar, press house, vats, crusher, hose, pumps, casks, etc., for a vineyard of thirty acres. But grape growing and wine making will soon become two distinct occupations. All the expense of cultivating, picking and marketing an acre of six-year-old vines, is about twenty-five dollars, and the crop sells at from eighty to one hundred dollars, leaving a net profit of from forty-five to seventy-five dollars, less the interest on cost and taxes. Sixty dollars is about the average cost of planting and rearing an acre of vines for three years, and deducting ten dollars per acre for the third year's crop, leaves a net cost of fifty dollars per acre, besides the cost of the land, which varies. Uncle Dickey Fulkerson, a careful and experienced farmer near Santa Rosa, who owns about twenty-seven acres of good bearing vines, and who sells his grapes, hauling them seven miles, says he would not take thirty dollars per annum per acre for the crop, if the purchaser would do all the work and pay the taxes and interest on the cost besides. This shows that grape growing is more profitable than wheat growing. It is highly probable that the business is yet in its infancy, and that the pure juice of the California grape will now take the place of the abominable stimulating mixtures called wine and brandy, with which the world is supplied. The grape land of Sonoma County extends from the bay on the south, to Mendocino County on the north, and from Napa County

on the east until within a few miles of the Pacific Ocean. The planting of vines goes on steadily, and every year the farmer knows better how and when and where and what sorts to plant. Most all the foreign varieties do well in this county, and a connoisseur could not help being satisfied with his choice of the many kinds he could find. The Native or Mission is, of course, the most common, and does well on any land that is not too rich. Of foreign varieties there are the Muscat, Black Hamburg, Zinfindel, Reisling, Black Malvoissie, Chasselas, Berger, White Malaga, Flame Tokay, and others. All of these grow well in Sonoma County. A field of vines upon the low hills adds much to the beauty of the landscape. They are of a rich green color, which they retain all the Summer, after most of the green things have faded. Then, in Autumn, when the rich clusters have changed from green to white, or purple or red or black, and the leaves are turning yellow, there is still a beauty in the vine. The time will probably come when our higher hills, too, will be covered with vines, when labor becomes cheap and all its products higher. Then there will be stone walls and terraces and cisterns, and all the land will be utilized. Many of the residences about Sonoma seem to be the abodes of pleasure and comfort. The vines support the family, and the "heathen Chinee" does most of the work in and out of the house. The profits admit of hiring the labor. The dwellings are smothered with vines, shrubs, and flowering trees, a fountain sparkles in the yard, gaudy flowers enliven the scene and perfume the air, long and wide avenues lined with fruit trees separate the vineyards from one another, the whole presenting a picture of elegant comfort, the owner of which is to be envied.

THE WINE PRODUCT OF SONOMA COUNTY FOR EIGHTEEN HUNDRED AND SEVENTY-FOUR.

We give below a carefully prepared and, we believe, very accurate estimate of the vintage of Sonoma County for this year. Our estimates were obtained, some by the number of acres and wine product in gallons, others by the number of vines and wine product in gallons. To give the reader a clear idea of the estimates we have classified them in exhibits. Exhibit A shows the number of acres of the parties named and product of wine in gallons, by the acre. Exhibit B shows the number of gallons made by the parties named, without giving either the number of acres or gallons. Exhibit C shows the number of vines of the parties named and the number of gallons of wine made by them. Exhibit D shows the amount of wine made in the vicinity of Santa Rosa. Exhibit E shows the amount of wine made by wine manufacturers who purchased grapes mostly of the parties named in exhibits F and G. The recapitulation shows the total product of wine in the county as made by the exhibits given, amounting to one million eight hundred and thirty-six thousand gallons. Exhibit F shows the number of vines of the parties named and the yield of grapes is given in tons. Exhibit G shows the number of acres and product in tons. No general average per acre is made or by the vine, for the reason that in many of the statements of the number of vines and acres, vines not yet bearing are included. The reader will please remember this fact. The product in tons per acre is from two and a half to five; the product in wine per acre is from five hundred to one thousand gallons, varying with character of land, location, and the season. The past season was one of the most remarkable

on record for the abundant yield of grapes; many vineyards producing as high as ten tons to the acre; but this is an exceptional year.

EXHIBIT A.

Showing the number of acres cultivated in vines, and the number of gallons of wine made by the parties named herein.

	Acres.	Gallons.
Gundlach & Dressel	240	115,000
J. R. Snyder	35	18,000
Henry Winkle	40	25,000
Jacob Haubert	50	45,000
Buena Vista Vinicultural Society	540	200,000
Total	905	403,000

EXHIBIT B.

Showing the amount of wine made this year by the parties named herein, the number of acres and vines not given.

	Gallons.
A. S. Edwards	40,000
L. W. Myers	14,000
Thomas Nau	8,000
C. H. Wise	4,000
Daniel Winegardner	4,000
James Shaw	7,000
J. A. Williams	34,000
Captain Justi	4,000
Dr. J. B. Warfield	30,000
C. V. Stewart	45,000
G. W. Whitman	35,000
George E. Watris	14,000
William Gurne	8,000
John E. Clark	23,000
Rummel Bros.	2,500
Jacob Esfall	3,000
P. D. F. Jewell	4,500
A. Lamot	24,000
N. Carriger	30,000
L. Goss	12,000
Carried forward	346,000

EXHIBIT B—(Continued.)

	Gallons.
Brought forward	346,000
G. F. Hooper	7,000
O. W. Craig	35,000
Herman Wohler	25,000
J. Trapoli	20,000
W. K. Rogers	40,000
M. Engler	15,000
Kohler & Frohling	75,000
W. A. Thompson	12,000
Total	575,000

EXHIBIT C.

Showing the number of gallons of wine from the number of vines cultivated by the parties named.

	Vines.	Gallons.
L. Tichner	120,000	70,000
A. F. Haraszthy	20,000	16,000
F. Ehrlich	12,000	10,000
J. A. Poppe	12,000	2,000
S. C. Collins	9,000	15,000
W. F. Ellis	6,000	7,000
Total		121,000

EXHIBIT D.

Showing the number of gallons of wine made this year in the vicinity of Santa Rosa.

	Gallons.
I. DeTurk	150,000
William Hood	50,000
Remmel & Co	80,000
Barney Hoen	30,000
George Shaw	10,000
Total	259,000

EXHIBIT E.

Showing the amount of wine manufactured by the parties herein named, from the grape crop of eighteen hundred and seventy-four.

	Gallons.
Mauschardt & Hoelscher	150,000
Fischer & Freul	90,000
Weyl & Leiding	60,000
A. Daminiani	40,000
C. Aguillon	30,000
Kitz Bros	8,000
Total	378,000

RECAPITULATION.

	Gallons.
Exhibit "A" shows	403,000
Exhibit "B" shows	575,000
Exhibit "E" shows	378,000
Exhibit "C" shows	121,000
Exhibit "D" shows	259,000
Total by exhibit	1,736,000
Estimated balance of county	100,000
Total wine product of county	1,836,000

EXHIBIT F.

	Vines.	Tons.
A. D. Lowell	7,500	35
David S. Jones	7,000	35
Mrs. D. C. Young	12,000	40
William Pickett	11,000	100
O. B. Shaw	5,500	60
John Tivnen	9,000	33
Howe & Hall	15,000	60
Howard Clark	8,000	40
K. Sneed	9,000	27
R. A. Merrill	6,000	27
Thomas F. Dunn	9,000	45
F. C. Ceipp	6,000	20
Chas & Denen	16,000	60
E. Gillin	3,000	15
—— Breitenbach	7,600	30
D. Church	11,645	25
David Jones	8,000	30
C. F. Leiding	7,000	20
A. G. Lyon	7,000	22
Joseph Foster	10,000	30
Henry Moller	9,000	30
Mrs. Fawcett	6,000	9
General Vallejo	12,000	42
Napoleon Vallejo	35,000	80
P. T. Vasquez	15,000	32
Mrs. M. Wooster	4,000	10
Carried forward	259,645	950

EXHIBIT F—(Continued.)

	Vines.	Tons.
Brought forward	259,645	950
Mart Wooster	5,000	7
P. T. Noarborn	4,000	7
W. Burris	5,000	25
Captain Harding	5,000	25
E. E. Morse	5,000	26
Mrs. Keil	2,000	4
James Cooper	2,500	4
Pat Moynihan	2,000	4
Mrs. A. Rodgers	6,000	15
James Haynes	2,000	3
Obed Chart	9,000	15
C. W. Lubeck	1,500	3
—— Lassy	4,000	6
H. F. Bates	500	3
—— McClay	600	3
Total	313,745	1,100

EXHIBIT G.

	Acres.	Tons.
F. S. Gloster	25	10
John Johnson	8	10
E. Rufus	14	100
Ward Bradford	14	100
Mrs. May Foy	15	60
M. Cheney	5	10
F. Campbell	8	30
Mrs. McLaughlin	40	100
—— Sawain	6	20
Duhring & Co	12	35
E. H. Morton	5	30
William Eldridge	6	12
E. Boettge	4	5
P. Douglas	3	6
Total	125	618

SHEEP HUSBANDRY.

Sonoma County offers the finest field for the successful prosecution of sheep husbandry. The grasses are more free from weeds and burs than the grasses of the southern counties, while the railroad traversing the county, from north to south, furnishes at any point of exit from the mountains on either side of the valley, an equal facility of transportation to nearly every sheep raiser. The lands on the coast mountains, being watered by the fogs, will sustain about five sheep to two acres, while those of the eastern range will support about one sheep to the acre. Of course, there are many sections which will do more than this, but it is not wise, generally, to pasture more sheep than in the above proportion. Sheep raisers, generally, have their lands inclosed with brush fence, and the sheep are permitted to herd themselves, thus saving the cost of a herder, which is necessary in the southern part of the State. This is at once an annual profit of four hundred dollars to the grazer of one thousand or one thousand five hundred sheep. It is also found, by experience, that sheep are less diseased, take less food to support them, and are less subject to accident during gestation and at parturition, when allowed to roam than when herded. The practice is to shear once in the Spring and once in the Fall, though many prefer only Spring clipping, believing that the wool is better and commands a better price.

An idea of the profits of sheep raising may be gained by relating the experience of a grazier on the coast. He shears but once a year—in July—and receives about seven pounds of wool from each sheep. This year he sold his wool at thirty-one and one quarter cents per pound. Last February he slaughtered some of his wethers, and sold each of the carcasses for five dollars. The pelts he sold for one dollar and thirty-seven and one half cents. The sheep weighed, when dressed, seventy-five to one hundred pounds, being a cross between the Cotswolds and Merino. The gentleman pastures about two sheep to the acre, and says that the increase of stock will pay the cost of keeping, shearing, interest on land, and all expenses, leaving the wool as a clear profit.

Of course, there is little land adapted to sheep walks unoccupied in the county, but many fine tracts, held under possessory title, can be purchased at cheap rates, the owners either having accumulated wealth enough, or desiring to remove nearer educational centers.

PRICE OF LAND.

The best agricultural land in this county can be bought for one hundred dollars per acre—land which will produce forty bushels of wheat to the acre, without the use of fertilizers after from fifteen to eighteen years of successive cropping. From the highest figure above named land ranges downward as low as five dollars per acre. There are thousands of acres, which may be bought for thirty dollars per acre, suited for grape culture. Five or six years after planting, vineyards will pay an interest on from two hundred and fifty to five hundred dollars per acre. This land is as good for other fruit as for grapes. For dairy products, butter, and cheese, for poultry and eggs, for fat cattle and sheep, for wheat and other staples, we have a market at our very doors. We have a better climate, are nearer market, and taking wheat or fruit

as a standard, our land is more productive. For these reasons it is worth more than land in the Eastern States, though, in fact, the price is not so high.

PROPERTY VALUATION.

The following table is the complete official statement of the assessment of each township in the county, in convenient subdivisions for comparison. It is worth preserving for future reference:

PROPERTY VALUATION.

TOWNSHIPS.	Amount of money...	Personal property....	Land.....	Improvements.....	Town lots.....	Improvements.....	Improvements on others' land.....	Total values.....
Cloverdale	$3,250	$116,889	$165,272	$48,965	$36,085	$53,625	$2,450	$426,536
Washington	2,220	55,573	153,588	29,194	3,545	7,600	1,550	253,270
Ocean	800	54,781	174,612	19,350	100	50	.....	249,693
Redwood	2,305	51,291	80,950	12,740	4,565	7,180	540	159,571
Salt Point	1,500	118,919	136,868	61,700	100	400	5,300	324,787
Vallejo	9,605	282,987	997,256	110,500	10,669	10,950	.....	1,421,967
Sonoma	14,915	430,503	973 156	317,925	27,550	71,930	2,350	1,838,349
Mendocino	18,604	593,264	700,424	156,184	120,565	183,860	2,480	1,685,381
Russian River	2,300	145,743	534,303	82,900	3,605	9,100	400	778,351
Bodega	2,675	161,774	486,466	70,815	9,975	20,350	.....	752,055
Analy	28,520	325,772	897,215	130,985	16,993	35,837	500	1,435,822
Santa Rosa	56,369	1,007,968	1,703,343	373,120	292,768	375,915	2,150	3,811,638
Petaluma	44,325	752,322	1,195,329	199,729	408,387	386,913	700	2,987.705
S. F. & N. P. R. R	.....	522,565	7,840	2,000	43,300	.....	.....	575,705
Total	$187,388	$4,530,351	$8,206,622	$1,616,107	$978,207	$1,763,730	$18,420	$16,700,825

By T. J. JONES, Deputy.

WM. C. GAINES, Assessor of Sonoma County.

THE WEALTH OF SONOMA COUNTY.

We give below an estimate of the wealth produced in Sonoma County in a year. Most of the estimates are rather under than over the mark. The quicksilver product is based upon the anticipated yield for the present year. Twelve furnaces will be running early in the Spring; one at the Mount Jackson mine near Guerneville, one in Sausal Cañon, and one at the following mines in Cinnabar District: the Livermore, Cloverdale, Geyser, Oakland, Missouri, Rattlesnake, Flagstaff, Socrates, Sonoma, and Anna Belcher. Much the greater part of this wealth is exported; in addition, enough is raised for home consumption:

	Annual Product.	Value.
Lumber (feet) at $10 per thousand	40,000,000	$400,000
Tan bark (cords) at $12	2,000	12,000
Firewood (cords) at $5	30,000	150,000
Butter (pounds) at 30c	1,400,000	420,000
Cheese, Limburgh (pounds) at 20c	300,000	6,000
Hay (tons) at $10	25,000	250,000
Wool (pounds) at 25c	400,000	100,000
Barley (bushels) at 65c	320,000	208,000
Oats (bushels) at 45c	360,000	150,000
Wheat (tons) at $30	18,000	540,000
Potatoes (sacks) at $1	350,000	350,000
Fruit (boxes) at $1	140,000	150,000
Poultry and eggs		100,000
Beef cattle, at $25 per head	8,000	200,000
Hogs, at $7 per head	30,000	210,000
Sheep, at $2 50 per head	25,000	75,000
Wine (gallons) at 30c	1,836,000	550,800
Quicksilver (flasks) estimated	10,000	1,500,000
Total value		$5,522,800

SONOMA COUNTY FINANCES.

Revenue from taxes.	
Total value of assessable property in Sonoma County for the year 1874	$17,000,000
State and county tax for 1874–5, at $1 53 per $100, distributed as follows: State tax, 64 9/10c., of which 22 3/10c. is for school purposes. County pays to State for taxes	110,330
County tax, 93 1/10c. per $100, distributed to funds as follows: General Fund, 20c.; School Fund, 26c.; Indigent Fund, 13c.; Road Fund, 14 1/10c.; Railroad Fund, 13c.; Building Fund, 1c.; Road Fund tax, 6c. Total revenue from taxes:	
State apportionment $110,330	
County apportionment 158,270	
	268,600
Liabilities.	
The county indebtedness is as follows:	
Railroad bonds, bearing 8 per cent, payable in 20 years, interest annual, January 1st	$263,000
Hall of Record bonds, 7 per cent, 20 years, interest payable semi-annual	20,000
Road bonds, 8 per cent, 10 years, interest annually, March 1st	93,000
Total county indebtedness	$376,000

Irrigation in California.

IRRIGATION IN CALIFORNIA.

THE SAN JOAQUIN AND TULARE PLAINS—NATURAL DRAINAGE SYSTEM—VOLUME OF DRAINAGE—METEOROLOGY—SOILS OF THE GREAT PLAINS AND THEIR SURFACES—A COMPREHENSIVE CANAL SYSTEM—PRACTICABLE FEATURES—FARMERS' CANAL OF MERCED, FRESNO CANAL, CHAPMAN'S CANAL, CENTERVILLE CANALS, PEOPLE'S CANAL, AND SAN JOAQUIN AND KING'S RIVER CANAL COMPANY'S CANAL—IRRIGATION IN PRACTICE—A REVIEW OF THE WHOLE FIELD.

[WRITTEN FOR THE SACRAMENTO RECORD, BY A CIVIL ENGINEER COMMISSIONED BY THE SACRAMENTO DAILY RECORD TO EXAMINE AND REPORT.]

"My God! we're out of sight of land!" was the exclamation of the new comer, clutching his companion's arm as they drove together across the great plain that opens to the south beyond the San Joaquin River. The hills that bound the horizon as the traveler moves up the valley, had receded further and further on either hand, until he raised his eyes, the hills had sunk from sight, and boundless plain extended to meet the sky, and then broke from his lips the natural exclamation—"My God! we're out of sight of land!" No other language serves, to my mind, to express so vividly the vastness, the boundless extension of that empire which mocks the inadequacy of nomenclature in its designation as the San Joaquin Valley. Its extent is literally inconceivable. We may state the area in thousands of square miles or in millions of acres, but we have no conception of what is meant by those thousands of square miles or millions of acres. Even upon seeing this area, traveling through and across it, we fail to grasp the magnitude of the thing. It grows upon one as the big trees grow. You see them first and rather wonder that they do not look bigger; you see them again, and they do look bigger; again, and they swell and expand on your sight, and you grow to appreciate their immensity. At last they come to transcend all the preconceptions you had formed, and satiate the anticipation that had grown of those conceptions. Unlike the trees, the San Joaquin and Tulare plains, which stretch for leagues upon leagues, drained into the San Joaquin River, at first view, not only equal but transcend the broadest

expectation that can be entertained of their magnitude; but like the trees they grow upon the imagination; they exalt and then fill it; they expand upon the mental vision, and in the end leave one with an idea of immensity, of an extension illimitable, exceeding even that that comes to one on the bosom of old ocean. Then they grow in beauty as they grow in proportions. An infinite variety of contour and of color develops itself in what was at first monotony. The plains are fascinating with a fascination of their own, as luring as that of the ocean or the mountains; and the traveler who has first been wearied with a tiresome uniformity, and oppressed with the steady down-pour of Summer heat, dazzled by the glare from the white skeletons of grasses or of more gleaming stubble, comes to find that an infinite variety and beauty lurk in the landscape; that to the hot noon, a cool eventide succeeds; that there are compensations even for the glare that tries and tires the unaccustomed eyes; and he ends by taking unto himself the soul and heart of the plain's life, and finding a very exultation in its largeness and freedom.

A recent American writer described his passage by rail across Bavaria. For more than two hundred miles of course, and on either hand, further than the eye could reach, waved a sea of grain, unmarred by fence and almost unmarked by hedge; the sheet of green seemed to him not only a beautiful but a grand thing. He described it to his countrymen as something almost worth going to Europe to see. In a little while the traveler who shall visit California may write back to his friends of a grander sea of goodlier growth, sweeping in one sheet across the vast bosom of California, until it waves against the foothills of the Sierra on the one hand, and runs its rippling line half way up the slopes of the Diablo range on the other—more than sixty miles away. How beautiful and grand soever this sight may be, a finer thing will be the lesson that it teaches—how all this goodliness and wealth have been wrought by man's intelligence, and energy, and courage. It is he who will have made the waste into a garden and the desert to bloom. To landscapes as fair, Nature can point as the handiwork, but this one man shall claim for his own. The time will at last have come when he was to apply in California the art that had made of Babylon, China, India, Japan, Mexico, and Peru, garden spots of earth. The nation youngest in birth had tardily learnt the earliest lesson that the oldest had to teach; but having learnt it, applies it with a decision and energy all her own. The era of irrigation becomes the third great epoch in the history of California, the point of her new departure upon a course that leads to a development of strength. Titanic measured by that of her compeers, and a wealth, imperial in its luxuriance.

SOILS AND SURFACES.

SOILS OF THE CALIFORNIA PLAINS.

Preliminary to any examination of the utility and detail of irrigation in California, the character of the soils and of their surfaces must be attentively considered. All our soils outside of the tule formation can be divided into two classes—adobes and loams. In general, these are clearly distinguished from each other, yet each passes by insensible degrees into the other. The amount of area intermediate between adobe and loam is however so small as to be unimportant. The adobes, which

are in general heavy and compact, are modified by the intermixture of gravels, of sand, and occasionally of alkalies, into lighter sorts. But the great bulk of adobe soil is compact, nearly free from grit of any kind, forming with water a highly tenacious mud, and contracting, as the water is expelled by heat, with the development of cracks on its surface and in its substance, while the bulk of the mass bakes into true brick—its degree of induration depending on the degree of heat applied. The effect of these peculiarities as a soil, is that the adobe, after absorbing water, forms, when exposed to the sun, a crust on top that, for a time, prevents loss of moisture by evaporation. Its compactness also prevents the escape of water by percolation, and equally resists its absorption of water by infiltration. Thus, after having become wet, it retains moisture for a season with singular tenacity. Later, when the formation of cracks has begun, it parts, through them, with the last particles of its moisture, and becomes indurated to a greater depth than any other quality of soil. In color, adobe may vary from black, through any shade of brown or red, to a gray—the tint depending on the presence of mineral or vegetable coloring matter. The loams, as distinguished from the adobes, are light and friable, and pass by insensible degrees from the more clayey heavier sorts by the infusion of increasing proportions of sand, through the lighter and sandy loams, to a pure sand. They are never free from grit; refuse to become fused by water into a smooth homogeneous mud; and, as the water is expelled by heat, are left with the particles imperfectly compacted, readily falling to pieces at a blow. The effect of these peculiarities as a soil, is that the loams, after absorbing water, part with it readily from the surface when exposed to the sun, but after the upper portion has become dried the moisture from deep portions is evaporated with slowness and difficulty. Their comparatively loose texture, however, permits the escape of water by percolation, and operates with equal favor to promote the absorption of water by infiltration. Thus a tract of loam adjacent to running water will absorb constantly from the stream and remain moist almost to the surface during the hottest season and without receiving any water from above. Adobe under like circumstances would bake to a brick, and in effect really repel infiltration from the running stream. Under the influence of rainfall loam will absorb the water until wetted through before it will shed it freely from its surface. Adobe absorbs with difficulty and will shed many cubic feet from its surface while slowly absorbing a few into its substance. And, supposing the two classes of soil to be irrigated, loam will absorb freely and allow the water to percolate as freely away; adobe will absorb slowly and retain what it gets, so long as cracks under the drying process do not penetrate its substance. After the surface is protected from the direct rays of the sun by vegetation these cracks are slow to form. The surface crust, which sometimes bakes to a degree that checks the growth of vegetation, need not be allowed to do so under carefully applied irrigation. It will be readily seen, from these hints, that the detail of the application of irrigation will vary, according as the soils treated are adobe or loam; that, in attaining the best results, the amount of water applied, the frequency of its application, and the copiousness of supply at different parts of the season, and at different stages of crop-growth, will vary between considerable limits for adobe soils, and for loams. Experience will, in time, develop these methods in their most favorable detail; it seems worth while here to point out to parties interested that this difference between adobe land and loam should never be lost sight of, nor the experience

on soil of the one character be accepted as an infallible guide to attain the same results on soil of the other character.

THE ADOBE BELTS AND LOAM BOTTOMS.

Illustrations of these characteristics of the adobe soils and the loams are to be seen in the large way in the progress of settlement throughout the San Joaquin and Tulare Plains. With the exception of two considerable belts that cross the plains on the east side, the loams are found adjacent to the river courses, usually constituting the "bottoms." These are the older settled lands of that section, occupied before irrigation or even railroads were in prospect. They are the Merced bottom, commencing at Snelling, the bottoms of King's River, the Four Creeks, the Tule River, where the Towns of Kingston, Visalia, Portersville, etc., have become established. Luxuriant crops of corn and vegetables have been grown on them, besides such wheat and barley as could find a local market. These are the lands upon which the culture of cotton has been successfully inaugurated. At the time they were settled up, occupation of the dry plains was not generally thought of. But some six years ago the planting of wheat began in a large way on the plains of Stanislaus County. With the construction of the railroad the farmers pushed into Merced, and later the "Alabama Settlement" was formed in Fresno County. The rainfall throughout this region was but trifling, and yet in parts of it considerable crops were made. The Town of Modesto, in Stanislaus County, and Merced, in Merced County, grew up as the centers of extensive and growing farming communities. The efforts of the farmers at the Alabama Settlement were a failure. Crops on the west side of the San Joaquin have in general been heavier under similar apparent conditions than those on the east side. Looking below the surface of this thing, what do we find? The soil of the west side is in general a compact adobe. A belt of the same soil sweeps across the east side at Modesto, and another at Merced. The soil of the Alabama Settlement is loam. The compact, tenacious adobe absorbed the trifling rainfall of that region, refused to give it up either by evaporation or percolation, retained sufficient moisture to bring forward and mature crops of wheat, barley, and oats. Local exceptions to this result evince the operation of the same cause. At places the adobe is lighter than in others, owing to admixture of gravel and other elements. On such tracts the past season the crops were almost uniformly light. At the Alabama Settlement we see the rich and deep but lighter loam yielding its moisture to the influence of evaporation, and failing to mature equal crops, while receiving an equal amount of rainfall with the heavy adobes further north. To land of this quality irrigation is essential. Without it the land is nearly valueless. With it there is scarcely an assignable limit to the variety and amount of crops which it will produce.

SURFACE OF THE PLAINS.

The San Joaquin and Tulare Plains have an uniform slope from south to north at the rate of one foot to the mile, and from the mountains on either hand towards the line of greatest depression, at the rate of eight feet to the mile. This uniformity of slope is to be understood in a general sense; when the engineer's level comes to be applied to it in detail important modifications are developed. On the east side of the river an important percentage of the entire surface, especially within twenty

miles of the foothills of the Sierra, is "hog wallow." The surface thus designated may be represented on a small scale by covering the bottom of a milk pan with eggs distributed so that their longer axis shall lie at every irregularity of angle with one another, and then pour in water till it is more than half the depth of the layer of eggs. The surface of the water and the surfaces of those portions of the eggs which rise above it, together constitute a surface which is a fair representation of that of hog-wallow land. It is obvious that this is a sort of land that cannot be irrigated at all.

Besides the hog-wallow there is an important area of land which may be designated as "billowy," the surface of which rises and falls in long undulations, which, though slight, are sufficiently marked to manifest themselves to the unassisted eye. In irrigating a surface which departs from an absolute inclined plane, it is essential to carry the distributing ditches over lines which shall take in succession the most elevated points. On billowy lands such lines will be sinuous, increasing the length of ditch necessary to be constructed in order to serve a given area. Between said highest points the lines pass over depressions; the construction of each ditch will involve, therefore, an alteration of cuts and fills, increasing its cost per unit of length. Thus it is seen that these billowy lands require not only a greater length of ditch to irrigate a given area, but, also, that the ditch is more costly to construct. In the third place, it here becomes impossible to lay the water upon the land by a system of parallel furrows leading in a common direction away from a main farm ditch—it becomes necessary to lead the water from the summit of each "billow" by a system of furrows radiating from that point over its entire surface. Although it is practicable to do this, yet the detail of accomplishing it is so much more costly and troublesome than the same work would be on more level land, that it is evident the latter will command a steady preference, and be first thus improved. The quantity of these more level lands is so enormous that years must elapse before they will be fully occupied, or the occupation of the billowy lands be generally begun. These may, therefore, be added to the hog-wallow as being beyond the scope of any immediate scheme of irrigation. Besides which, it may be mentioned that most of the hog-wallow, and much of the more level land, is a shallow soil, underlaid by hard-pan. Eliminating the hog-wallow and billowy land, which constitute, perhaps, nearly one half of all the land on the east side of the San Joaquin, between the Tuolumne and King's Rivers, we have left the vast area of the "west side"—the whole of which, north of Firebaugh's Ferry, is nearly an absolute inclined plane, and, also, the larger part of the east side—a perfect plain to the eye, but upon which the instrument discloses an irregularity of surface to which the word "uneven" may be applied. "Uneven" though we call this, it is more even than any of the land north of Stockton, excepting some three or four isolated fields in the immediate vicinity of that city. It is so even that the eye cannot detect the direction of its inclination, nor the slightest intimation of irregularity on the surface. But the engineer's level, determining the lines for distributing ditches by seeking the highest points, sends them sweeping around in great curves, tracing their course like the track of huge serpents over the plain. As the ditches follow the lines of elevation it follows that between them, and more or less nearly parallel to them, lie corresponding lines of greatest depression. The practical problem in the application of irrigation here will be to conduct the water from the high lines to the adjacent low ones on

the shortest course—thus distributing it with equality to all parts of the intervening surface. To do this the irrigating furrows will maintain a direction generally perpendicular to the curve of the ditch, diverging from each other where the curve is convex, and converging where it is concave. The lines of checks from furrow to furrow will themselves be curved and substantially parallel with the curve of the ditch. Before, therefore, the farmer can proceed intelligently to make his irrigating furrows, the engineer must run him a set of contour lines sufficiently close to enable him to determine the direction of inclination in each field. These matters once ascertained, and marked permanently upon the ground, the detail of irrigating these "uneven" lands will not differ in practice from that applicable to the true inclined plane surface of the "west side."

FORMATION OF THESE SOILS.

Without going profoundly into the geology of these regions, the method of the formation of soils differing thus widely in character having apparently only one characteristic of unbounded fertility in common, can be explained. The hog-wallow, with its underlying hard-pan, shows the retreat of the broad foot of the glacier, leaving behind it the accumulated dust and debris of pulverized rock, arranged in its present form by the innumerable rills that issued from the retiring sheet of ice. The same rocks were ground up to produce the elements of the loam and of the adobe; we find only that these elements subsist in the two soils in different states of mechanical division. In the loams deposited by waters flowing in streams and rivers with a velocity sufficient to carry along much of the matter suspended in a state of extremely minute division, we find the constituent particles of coarser grain. It would be difficult to believe that the vast areas of adobe constituting a large part of these plains, and often of great depth, were due to a surface wash of water like that of ordinary rainfall. But directly along the base of the foothills, overlying perhaps the hog-wallow, or the loam of the original formation, we find a strip of true adobe, from a half mile to five or six miles wide, bearing the color of the hillside above it, which appears evidently to have been formed by rain-wash from the hill above. The effect might still appear too great to be attributable to this cause, till we learn that a considerable part of this strip of adobe—in some localities known as "dry bog"—has increased or been formed within a few years past; and a new conception of the energy of this cause comes with the knowledge that of one strip, five miles in width, more than half was formed, over what had been hog-wallow, during a single wet Winter—that of eighteen hundred and sixty-four. Here we learn that the rain-wash does actually form adobe; that its energy is sufficient to form an extensive area of it in a single season; and accept without difficulty the conclusion that the same soil has been formed elsewhere by the same agency. This explanation at the same time accounts for the peculiarities of the adobe, the absence of grit in its composition, its difference from the loams, and the relative position of the two where they are found in juxtaposition.

VALUE OF DRAINAGE.

Knowing the area which drains into a watercourse and the amount of rainfall over that area, the volume of water that will be discharged

can be calculated according to formulas that have been deduced from careful observation and measurements. The area drained is called the "cachment area" of the watercourse. Allowance is to be made for absorption of the rainfall into the soil, loss by evaporation, etc.; the remainder will be the theoretical discharge of the stream. These figures of cachment area and theoretical discharge, for a number of the principal rivers of California, are as follows. The areas are given in square miles, and the discharge in cubic feet per second:

Name of river.	Cach. area.	Discharge.
Feather	33,939	444,666
Kern	2,382	340,882
American	1,889	285,532
King's	1,853	282,426
San Joaquin	1,630	256,649
Tuolumne	1,513	241,320
Yuba	1,329	220,111
Merced	1,072	187,077
Cache Creek	1,025	181,152

In order to get some idea of what these figures mean, suppose a river to have an average width of five hundred feet between the banks, discharging a stream of water ten feet deep; the sectional area of the volume of water will be five thousand square feet. A velocity of three miles per hour will be equal to about four and a half feet per second; and if the above volume be supposed to flow with this velocity, the amount discharged per second (disregarding friction) will be twenty-two thousand five hundred cubic feet. A stream averaging three hundred feet wide by three and a third feet deep will have a sectional area of one thousand square feet; and, flowing with a velocity of two miles per hour (equal to say three feet per second), will discharge a volume of three thousand cubic feet per second. With a sectional area of two thousand square feet the discharge would be six thousand cubic feet per second. These special cases will be recognized as approximating the actual discharge of several of the large streams above named, at their lower stages. We may pause to collate the relative discharge of canals of different sectional areas. The highest velocity safely allowable to the water within canal banks without endangering the stability of the banks, is about two feet per second, or say one and a half miles per hour. A canal stream one hundred and twenty feet wide on top, eighty-four feet on the bottom, and six feet deep, will have a sectional area of six hundred and twelve square feet. At a maximum velocity of one and a half miles per hour, the discharge per second would be one thousand two hundred and twenty-four cubic feet. A width of stream sixty-eight feet at top, thirty-two feet at bottom, and six feet deep, would have a sectional area of three hundred square feet. At the above velocity the discharge would be six hundred cubic feet per second. A width of forty feet at top, twenty feet at bottom, five feet depth, would give sec-

tional area one hundred and fifty square feet, and a discharge of three hundred cubic feet per second. It will be observed that in comparison with the rates of discharge above given for different rivers, the capacity of these canals is from one tenth to one twentieth of each stream. Thus, taking the sectional area of the San Joaquin River at its lowest stage at three thousand square feet, and its rate of flow at two miles per hour, we remark that its discharge (nine thousand cubic feet per second) is equal to the combined capacity of fifteen canals, each thirty-two feet on the bottom—the dimensions of the San Joaquin and King's River Company's Canal, which takes its water from that stream.

Recurring to the above table of the cachment areas and discharge of the rivers of California, it is to be remarked that the actual discharge is far below the theoretical. For the purposes of irrigation the discrepancy is not important, for the actual discharge is seen to be ten times greater than can be applied to that purpose. But it is interesting to inquire what becomes of the water. We know the full amount that falls in each cachment basin; we know that it does not flow off through the visible drainage channel; the inference is inevitable that a great part of it passes away through underground strata of gravel and other permeable composition. If this be true, we shall expect two things: first, that the existence of such underground water-flow would be disclosed by borings; and second, that some of these strata would be intersected from time to time by the watercourses, which would then receive the flow of each stratum, resulting probably in an appreciable increase in the volume of water flowing in such channel. Both of these conditions are found to exist in fact. In connection with the surveys for the canals now under construction, extensive borings were made at the San Joaquin River, its tributaries, and in the vicinity of Tulare Lake. In each instance the existence of an extensive underground drainage was disclosed. The fact that the main river courses receive accessions to their volume of flow from these sources is familiarly illustrated throughout their length. The San Joaquin, at Firebaugh's, runs one half more water than it does at the railroad crossing, though in the interval it does not receive a single tributary. King's River, at Kingston, flows double the volume that it does at the upper ferry, and at the upper ferry it flows one half more water than at Centerville, yet it receives no tributary. Other streams that flow a large volume of water at one point, a few miles lower are dry beds. In fact, there is scarcely a California stream that does not illustrate the fact of underground drainage by one or both of these classes of phenomena.

Tulare Lake, and the drainage system in which it plays the part of reservoir, illustrates underground drainage upon a great scale. During a portion of the year the surface of this lake is raised sufficiently to discharge by overflow the surplus of waters poured into it by Kern, Tule, and King's Rivers, and Kaweah Creek. But after the waters have subsided so that overflow ceases, those large rivers continue to discharge into the lake an amount of water equal to the discharge of the American and Yuba Rivers and Cache Creek combined—exceeding many fold the greatest possible amount of depletion by evaporation. Yet the lake contrives to get rid of a greater amount of water than it receives; the level of the surface is slowly lowered throughout the season; underground drainage here becomes the only possible means of efflux; and in fact the borings made adjacent to the lake disclose the existence of a copious underground flow—the measure of which is indicated by the combined influx from Kern and King's Rivers. When the levees shall

be constructed which have been proposed in connection with a general irrigation system, converting the lake into a reservoir and raising its surface so that its waters can be conducted out over the surface of the soil, the entire volume of water then conducted by the canals will be an addition to the supply available for irrigation and transportation, without abstracting any part of that which now flows through the natural drainage courses. The same thing may be true of other irrigation works depending on this matter of underground drainage, as it operates upon the streams and at the point whence their supply is obtained. Thus the effect of the San Joaquin and King's River Canal upon the volume of water flowing in the San Joaquin, has been tested by the experiment of closing the head-gates so as to exclude all water from the canal. The effect was to raise the water in the river below the head-works exactly one inch! The explanation of this apparent anomaly is, that about this portion of its course the San Joaquin receives an important accession of volume from underground drainage—probably from the Tulare Lake drainage; thus its waters are maintained at a given level, whether one canal full be abstracted or not. It is possible that an amount of water might be taken from the San Joaquin at this point equal to the volume discharged into the lake by King's River, without materially decreasing its volume. Such an amount would require three or four canals of the size of the present one. The fact that one tenth of the visible volume of the river at its lowest stage can be taken from it with a decrease of volume which is barely appreciable (lowering the surface one inch) is very remarkable, and of a high degree of scientific interest.

METEOROLOGY.

Besides the absence of rainfall, explained above, other important features of the meteorology of this region are the winds and dews. Throughout the Summer a fierce wind from the northward, parallel with the main axis of the plains, draws over them from one end to the other. With some local exceptions, it appears to increase in intensity proceeding southward. It is due to the heating of the table lands and deserts lying beyond the Tejon, rarifying the atmosphere over their surface, which rises, while a portion of that from the California plains rushes in to fill its place. These gales rise daily soon after sunrise, and continue to blow till towards midnight. It follows that large areas of the plains, fitted by soil, irrigation, and other circumstances for the cultivation of cotton, hops, and such crops of the more valuable sorts, will be unavailable therefor at present, and until trees—all kinds of which appear to flourish luxuriantly under the stimulus of irrigation—shall have been planted and attained sufficient size to afford protection from this zephyr of truly California type. Where the native trees now grow, the protection is often sufficient, and amid the stately groves of Tulare County every crop can be raised with profusion. The absence of dews throughout all the region north of Tulare Lake must also be noticed. To the east of that lake the dews appear again and are often heavy. What differences, if any, in the character and growth of some of the more valuable crops in these several localities may become attributable to this circumstance, experience must be left to determine.

IRRIGATION.

NATURAL DRAINAGE SYSTEM—THE KERN COUNTRY.

The natural drainage system of the country, embraced in what are called the San Joaquin and Tulare "Valleys" (a misleading word to designate those vast, and, to the eye, boundless plains), is as follows:

At the extreme south the Kern country is a grand circular plain, around which sweep, for three fourths of its circumference, the Sierra and Coast Mountain systems. These limit it on the east and west respectively, joining their areas of upheaval to form its southern boundary. This country is open to the north (the direction of the flow of its drainage), where it is bounded by Tulare Lake. At its upper or southern end are two small lakes—Buena Vista and Kern. All these southern lakes, it must be understood, are not basins of water surrounded by hills—they are merely areas of the general plain which shelve downward at a slope so slight as to be imperceptible to the eye. A rise of a few feet in their water extends their surface for several miles over the surrounding plains. In fact, a rise of only three or four feet above ordinary high level in Tulare Lake, serves to place the entire country, for an area embracing hundreds of square miles, under water. At the ordinary Summer stage of water, cattle are seen feeding out in the lake on the long tule grasses, a distance of a half mile to a mile from its margin, standing knee-deep to belly-deep in the water. We see, then, that the drainage system of the Kern plains and their bounding mountains is, that the rainfall is first poured into Buena Vista and Kern Lakes at the upper or southern boundary of the plain, whence it flows down into Tulare Lake at the northern boundary. On the eastern side, Kern River and other considerable channels pour the waters from the adjacent portion of the Sierras directly into Tulare Lake. On the western side, the mountains approach the lake, and at a single point send down a spur to its shore.

NATURAL DRAINAGE—TULARE.

A second great natural division of the country, and lying next north of Kern, is that which drains directly into Tulare Lake, embracing the whole of Tulare County, and so much of Fresno County as is drained by King's River, which empties into the lake near its northern extremity. The civil and natural division between Kern and Tulare Counties, is the line of Tule River, which empties into the eastern side of Tulare Lake, near its center. Going north from the Tule we come next to the considerable river known as Kaweah Creek, which, dividing east of Visalia, into four principal channels, gives name to the "Four Creek Country," or Visalia Delta; these creeks also flow into the lake. Next north comes the great King's River, discharging the rainfall of the stupendous King's Cañon, and its tributary mountain chasms, the grandeur and sublimity of whose scenery have been the inspiration of some of the most glowing descriptions given by Clarence King, and other explorers of the high Sierra. In these descriptions it will be remembered that the high Sierra, as seen from Mounts Tyndall, Whitney, or other of its loftier summits, presents itself as a wild sea of stupendous peaks, tossed into the sky in titanic confusion, and deeply cleft by two principal chasms, which start from a common point, and sweep away—the one northwardly and the other southerly—

receiving the waters which are precipitated in the form of rain and snow upon that entire mountain system, and carrying it down toward the plain. The northerly cleft is the cañon of King's River; that to the southward is the channel of the Kern. Soon after the early rainfalls, and during the melting of the snows, these cañons are the channels of deep, broad, boiling torrents, pouring down at a high velocity, streams of water which have a cross-section of thousands of square feet, into the great natural reservoir of Tulare Lake. This is soon raised above the level of its natural barriers, and sends down the surplus waters through Fresno Slough into the San Joaquin River.

NATURAL DRAINAGE—THE SAN JOAQUIN.

North from King's River lies the third and last natural drainage division of this country, embracing the area drained directly by the San Joaquin River, with its tributaries, the Fresno, the Merced, the Tuolumne, Stanislaus, and a number of lesser but not unimportant streams, as the Cottonwood, the Chowchilla, etc. Observe that all these streams flow eastward from the Sierra. On the west of the river the comparatively low mountain system causes little condensation and rainfall, and that which it does cause takes place, principally, on the western slopes of the hills toward the coast, and forms the various small streams that run into the ocean at Monterey Bay, and thence southwardly. The moisture contained in the lower strata of atmosphere coming inland from the ocean, is thus, principally, condensed and precipitated by the hills, before it reaches the San Joaquin County. The moisture contained in the higher strata continues on its eastward course uncondensed, until precipitated by the high Sierra. From the ragged sides of these mountains it is sent down in torrential flow through its natural channels to the bay. Thus it comes that the thirsting plains of the San Joaquin are first cheated of the rainfall that might make them the garden of California, and are next mocked by the rush of the same waters flowing between parched river banks, idly to the sea. And thus it comes that there are no important tributaries flowing from its west side into the San Joaquin. At the lowest stage of these streams the past Summer, the San Joaquin, at Firebaugh's Ferry, above the points of junction of its important tributaries, flowed a body of water with a cross-section exceeding three thousand square feet, to which the Tuolumne afterwards added its streams, then running with a section of six hundred square feet. The stream of King's River, at the same date, after the upper ferries had stopped on account of the low stage of water, was running with a cross-section of about one thousand square feet.

CANALS FOR IRRIGATION AND TRANSPORTATION.

A COMPREHENSIVE CANAL SYSTEM.

"A comprehensive canal and irrigation system" may be illustrated by the more familiar idea of a comprehensive railway system. It is easily understood that the latter ought to consist of two trunks, running one on the east side of the San Joaquin River and one on the west side, combining to form a main stem from a point—say at Bantas, and thence along a natural grade by the Straits of Carquinez to deep water.

Branches at proper points, running up to the foothills, would complete the system. A comprehensive canal system (such, for example, as might be wisely undertaken under a more efficient political system than ours, as a Government work), would consist of two main canals, one starting from Kern Lake, and the other from Buena Vista, running northwardly on either side of the great plains. These canals should be laid out on the least practicable grade, so as to hug the foot line of the hills, and thus embrace, sloping away from them to the central line of depression, the entire area upon which irrigating water could be brought. As the great natural streams were successively encountered, the necessary portion of their waters could be utilized to maintain the canals at full flow. Such a foothill canal could extend continuously from the south, along the Sierra, until it made a junction with another like work coming down the edge of the Sacramento plains from the north. This northern canal would take its rise in the streams draining that area of upheaval of which Mount Shasta is the dominating peak. From the same system of streams, a like canal would come down on the west side of the Sacramento plains, and terminate at the Straits of Carquinez. On the west side of the San Joaquin plains a corresponding canal, starting from the Kern lakes, would hug the western foothills till it reached the bay at or below Antioch, in Contra Costa County. By such a system of main exterior canals, the entire interior plains of the State would be embraced, their area lying below the level of the canals and sloping away from them at a generally uniform descent of eight feet to the mile.

To apply the system, branch canals should be run from the mains at proper points across the plains eastwardly and westerly, towards their central lines of drainage—the Sacramento and San Joaquin Rivers. These branches would be the service canals for the distribution of water for irrigation. The main outside canals would have a width of probably one hundred and twenty feet. The branch or service canals would have a width of say seventy feet. Thus, these two parts of the system would be canals for navigation and transportation, as well as for irrigation. From the branch or service canals the water would be taken by distributing ditches (say ten feet wide), and delivered from these directly into the farm ditch. The main, the branch, and the distributing works would be constructed as parts of the irrigation system; the farm ditch would be constructed by the land owner, and would be private property, to be maintained and operated at private expense, and as a permanent improvement upon the land.

But a system as thus constructed would, in the San Joaquin country, be incomplete, for the reasons: first, that the main river of that section is not navigable the year round; and second, that the periodical overflow of Tulare Lake, King's River, etc., has not been provided for. A levee thrown around the lake converts it into a vast reservoir of nearly eight hundred square miles area, storing up the waters that now run to waste at a time when, the lower streams being full, they are not even needed in aid of navigation. But the rivers emptying into the lake, for miles before they reach it, flow through a country so nearly level, that if the lake alone were leveed, its waters would tend to rise higher than the banks of the tributary rivers, and so would flow over these into the plains. It would be necessary, therefore, at the same time, to construct levees along the banks of the lower portions of these rivers, to a height equal to that constructed around the lake. A main canal extending from the great natural reservoir thus improved, down the valley to the head of permanent navigation, would then complete "a comprehensive

canal system" for transportation and irrigation in the San Joaquin country. With the entire system as thus sketched, constructed, it would be complete as well as comprehensive for the whole interior of California.

A PRACTICABLE SYSTEM.

Works of the magnitude indicated could be constructed only by a Government. Public opinion would widely refuse to allow any branch of our existing government system to undertake the work. Those portions of the works which are subsidiary to the great exterior works may be constructed independently of these, and independently of each other. Taken singly, they are not beyond the ability of private enterprise to manage. In time the several parts may grow into a comprehensive whole. Meanwhile, each part may be as efficient to perform its individual function, as it could be in the completed system. Take first the case of what we have called the branch canals. These would start from the main canal—some of them, perhaps, at the point of crossing a river. Such a one can be constructed at present. Instead of taking its water from the main canal, let it take water directly from the river. This need not interfere with the ultimate construction of the main canal. Having taken the water, let the canal be constructed on the proper line; that is to say, the most elevated level practicable course, so as to serve the largest practicable area of ground. When completed, this will be a canal for navigation and transportation. On the east side of the San Joaquin it will intersect the railroad as a branch road would do, bringing produce to it. This is the class of works which are under actual construction at present. Prominent among them are the Farmers' Canal, of Merced; the Fresno Canal (Friedlander's), at Borden Station, in the Alabama Settlement; Chapman's Canal, east of Firebaugh's; the People's Canal, above Kingston, on lower King's River; the Centerville and Fresno City Canals (San Joaquin Land Association's), on upper King's River. The San Joaquin and King's River Company's Canal, the most extensive work of all, is a part of the main central canal to run from Tulare Lake to tide water at Antioch. These works, all of which are important, not only locally, but as possible parts of the grand comprehensive system of the future, merit particular description. The general public, outside of the parties directly interested and residents of the localities affected, has not yet begun to realize what is doing in these directions, both by self-helpful local associations, and by the capitalists, who, as land holders, have undertaken these works as a means to bringing their vast possessions into market.

CANALS UNDER CONSTRUCTION.

THE FRESNO CANAL.

A very good idea of the general plan and method of irrigation works can be obtained from the Fresno River Canal, now being constructed by Mr. Isaac Friedlander, near Borden Station, on the railroad, in Fresno county, to irrigate the lands of the Alabama Settlement, together with other extensive tracts owned by that gentleman and others. In this case the main canal commences at Fresno River, at a point about two miles east of the railroad, and is constructed thence southwardly to Cottonwood Creek, a distance of four miles. It is proposed to proceed

with the canal south from the Cottonwood, crossing that stream, continuing its course to an intersection with the San Joaquin, a distance of about nine miles. For the purpose of constructing the canal a careful exploration was made by Mr. Alfred Poett, civil engineer, in eighteen hundred and seventy-one, of the Fresno River, following its course to the headwaters; also of Snow Creek and other streams, with a view of adding to the present supply given by the Fresno. The examination of the Fresno, about three miles above the present railroad crossing, showed by borings taken, that a large stream of water filtered through its bed, even during the driest season. In view of this fact it was thought worth while to construct a tight dam, made solid and well, down into the hard-pan strata under the sand, thereby holding the water, in the hope thus to secure water enough for irrigation, not only during the Spring, but also enough during the Summer, for a second crop. The latter part of the object aimed at has not been secured. Although the tight dam has been built deep below the sands of the river bed, the water continues to flow through these stratas, showing that it makes its way around the ends of the dam.

In November, eighteen hundred and seventy-two, the present works were commenced, too late in the season for favorable work. The Winter rains not only interfered with the progress of the dam, but tested its stability by a very trying test. The dam and head-gates are now completed, also the canal from the Fresno to the Cottonwood, the final finishing touches having been given in the latter part of July, when the three distributing ditches were also completed to the railroad—a distance of two miles for each, or ten miles of main and distributing canal in all.

The dam is a timber structure, three hundred and eleven feet long, and raising the water six feet above original level, constructed of two rows main piles from twenty to thirty-five feet long, planted ten feet apart, the points firmly imbedded in a stratum of clay. Between the main piles is a double row of four-inch sheet piles. The space between the two rows of piling is filled in solid and planked on top. The action of the water during freshets on the river bed below the dam is guarded against by a timber "apron" of four-inch planking—an incline set to receive the water as it tumbles over the dam and shed it off on its course down stream, upon a thick layer of loose rock work. When the water reaches the top of the dam it is backed up, forming a lake one mile long by five hundred feet wide, with an average depth of five to six feet. The water is turned into the canal, by the opening of six gates, into a flume or timber box thirty feet wide. Through this fluming it is turned into the canal.

This work is constructed with an uniform width at the bottom of twenty feet. The sides rise on a slope of one foot vertical to two feet horizontal, to a height of eight feet, carrying six feet of water. This is the waterway or channel which is expected to flow full of water. The water at the surface is therefore forty-four feet wide. The banks are carried up higher, on a steeper slope, and on the top are four and a half feet wide. The canal is taken from the river at the highest point necessary to convey water to the irrigable ground. This point is in a ridge of "hog wallow." The cutting through this ground is quite deep, and at the river the canal work has the imposing appearance of a railway cutting. It is run on a grade of six inches to the mile, which will give a flow of the water at a rate of one and a quarter miles per hour, and will discharge, when running full, three hundred and sixty cubic feet of

water per second. This nearly horizontal grade soon brings the canal through the "hog wallow" ridge and out upon the upper edge of the general plain. It follows the main course of this edge, cutting through two other ridges of "hog wallow," which make down upon the plains, in its course to the Cottonwood. Where cutting for the canal has to be done, the method of doing the work is the same as that pursued for railway cutting. The bottom is plowed up and the loose earth scooped up the shelving sides with horse-scrapers. In the "hog wallow" a hard-pan is encountered which is blasted, and adds materially to the cost of the work. When the bottom of the canal comes out upon the surface of the general plain, the banks are formed by scraping up the earth material from the outside. Plow furrows are run along outside the base of the proposed bank, and the loosened earth scooped up into long ridges by scrapers. These ridges are afterward carefully trimmed and dressed smoothly and constitute the banks of the canal. They are made as smooth and even as the flower-beds of a city garden, or the terraces of the Capitol grounds. Their outside slope is one foot vertical to one and one half foot horizontal. From the other dimensions already given, it will be seen that a cross section of these banks is as follows: top, four and a half feet; bottom, thirty-two and a half feet; height, eight feet; cross section, one hundred and forty-eight square feet; cubic yards of earth to be moved for each one hundred feet of canal (two banks), one thousand and ninety-six. Contract price for this kind of work in ordinary ground, say fifteen cents per yard; cost of canal in this good sort of ground, one hundred and sixty-four dollars and forty cents per one hundred feet, or say eight thousand six hundred and eighty dollars and thirty-two cents per mile. When the canal is cut to a depth of four feet, instead of being built wholly above ground, the amount of earth to be moved for each one hundred feet of length, is four hundred and fourteen yards—costing, at the above price, say three thousand four hundred and twenty dollars per mile. The length of canal constructed to Cottonwood Creek is four miles; projected extension to the San Joaquin, nine miles more, or say thirteen miles.

Water is delivered from the canal into the main distributing ditches by an arrangement of gates and fluming or boxing. The bank of the canal is rounded or curved to approach the gates. The main distributing ditches are ten feet wide at the bottom; slope of bank inside, one foot vertical to two feet horizontal; width on top, two feet; height, two feet; number of cubic yards of earth to each one hundred feet of bank, twenty; cost to construct, at fifteen cents per yard for each one hundred feet of ditch (two banks), six dollars; cost per mile, say three hundred and sixteen dollars and eighty cents. The work upon these main distributing ditches is done in the same way as upon the canal; lying almost wholly on the surface of the ground, there is little or no cutting and the banks are constructed by plowing outside their line, scraping up the plowed soil to form the bank, and then dressing and trimming. These main distributing ditches have a grade which depends on the ground, the maximum rate being thirty-three inches to the mile; this should give a rate of flow of nearly one and one half miles per hour, and discharge for each ditch forty-five cubic feet of water per second.

The amount of discharge above noted for the canal (three hundred and sixty cubic feet per second) will be adequate to give from three to four inches in depth every forty days during the season, to an area of

seventy-two thousand acres. When running only four feet full the discharge would irrigate in the same way thirty-five thousand acres.

I have described these works at some length, because they constitute in some sort model works, and because they make by no means the most favorable showing for irrigation enterprise. They have been costly for their extent, owing largely to the fact that the head-works (dam, etc.) were constructed during the Winter with the river running full; and second, because the greater part of the canal, from the beginning to Cottonwood Creek, passes through a hard-pan cement rock. The total cost of the works approximates to sixty thousand dollars, while for the same character of works, constructing the head-works during the dry season and with ordinary earthwork in place of hard-pan, forty thousand dollars would suffice. The work on the extension of this canal beyond the Cottonwood will be of this lighter character.

Some idea of the part to be played by irrigation in the internal economy of the State may be formed by observing some of the results rendered possible by this comparatively small work. Suppose the seventy-two thousand acres which it irrigates to be cultivated to wheat. The result is a crop of one million eight hundred thousand centals, or say, ninety thousand tons; value at the railroad, which passes through the land, two million five hundred thousand dollars It is not likely that any crop less valuable than wheat will be raised. Five thousand acres planted to alfalfa would more than maintain all the dairies in Marin County. If it shall prove that the land is suited for cotton, a crop to the value of five million seven hundred and sixty thousand dollars should be annually taken from this area. And yet the dimensions of this irrigation system, in comparison with the works in progress elsewhere, and these in comparison with the comprehensive works projected, are very small. The imagination refuses to follow the effects of general irrigation as displayed by the experience already had, to their legitimate consequences.

The dimensions that ought to be given to a canal, in order that it may irrigate a particular area, or the area that may be irrigated from a canal of particular dimensions, may be deduced from the following data: the "duty" of one cubic foot of water per second flowing through a canal is to irrigate two hundred acres of land, giving to the same, during the season, a depth of eleven and one half inches, or one thousand five hundred cubic yards of water per acre. In many places, if not usually, one half this amount is expected to suffice; and, in that case, the "duty" of one cubic foot per second would be four hundred acres.

The highest velocity permissible where the canal banks are of loose earth, as in the California canals, is two feet per second (say one and one third miles per hour). In a canal of favorable section—flowing say five feet of water on a twenty-foot base, and with side slopes of two to one—the rates of flow would be approximately as follows: on a fall of nine inches to the mile, two feet per second; on a fall of six inches to the mile, one and three quarters feet per second; on a fall of three inches to the mile, one and one quarter feet per second.

If the water be shallower, the width less, or the slope of the banks flatter, the rate of flow, at the above rates of fall, would be somewhat less; but the above figures may be taken in order to get at approximations to the practical work that may be expected of a canal of given dimensions.

FARMERS' IRRIGATION COMPANY OF MERCED.

The Farmers' Irrigation Company of Merced was formed to bring down water from the Merced River, at a point near Snelling, for irrigation upon the plains between that river and Bear Creek, and from the foothills to the San Joaquin River. Among the leading parties connected with the enterprise are William G. Collier, the Messrs. Cressy Brothers, Upton, Fowler, Douglas, Morrison, Gray, Elliot, Jolley, Fitzgerald, and Rogers—all farmers within the district to be improved. The company has succeeded to the water rights of the Robla Canal Company, an organization formed in eighteen hundred and seventy, to carry water for irrigating purposes into the Bear Creek country, which took up the water claim on the Merced River, referred to above. Under the rights of the Robla Company, twelve miles of uncompleted canal have already been constructed, at a cost of twenty thousand dollars, between the Merced River and Bear Creek—dimensions, bottom fifty feet; top, eighty feet; height, three feet, to be increased to five feet. As rapid a descent as can be safely allowed in grade is one foot to the mile, giving a velocity to the water of about two feet per second. At this rate the discharge of a canal of the above dimensions will be four hundred cubic feet per second, sufficient to give during the season a depth of twelve inches of water over eighty thousand acres. Upon much of this Merced and Bear Creek land it is thought that one good wetting, with four inches of water, after the crops are well started, will suffice to mature them, and would render the supply of the Merced Farmers' Canal adequate to the actual necessities of over three hundred thousand acres.

The proposed canal will start from the Robla Company's water claim above Snelling, and follow down the foothills a distance of five and one half miles to a point on the divide between the Merced and the Bear. Here the canal branches, one part carring one fourth of the water, going into the channel of Canal Creek, which it pursues some distance, and is then taken out and carried across to the Bear above the point known as the Roblas, whence the original enterprise takes its name. From the fork of the canal the second and main branch, carrying three fourths of the water, makes a long sweep around the tongue of the divide, keeping well upon the flank, until it crosses the Bear at a point nine and one half miles east from the Town of Merced, and passes in a broad sweep southwestwardly into the San Joaquin. The lengths of the several portions of the proposed works are: from the head to the fork of the canals, five and one half miles; thence, by the line of the main fork to Bear Creek, thirty-three miles; thence, to its debouchment in the San Joaquin, twenty-two miles—total length, sixty miles. Final surveys have not yet been made for those specifications of construction that determine the cost. The head-works, it is stated, will be inexpensive, which, perhaps, means that they will cost less than ten thousand dollars. South of Snelling, in order to come out upon the divide, the water will have to pass through a fifteen-hundred-foot tunnel. If this tunnel be given an inclination of twenty feet per mile, or five feet eight inches in the one thousand and five hundred feet, and be six feet wide by five feet deep, it would discharge the quantity of water carried by the main canal, which would have a velocity in the tunnel of thirteen feet per second. It is thought that this tunnel, or a part of it, at least, can be safely left without timbering. The material is a lava, which

works freely under the pick. But moving at the velocity assumed, the water would possess such power of erosion, perhaps, slowly caving the material, which would then be deposited in the canal, and thus endangering the permanence of the whole work, that prudence may demand the lining of the tunnel throughout with timber. The cost of the mere excavation may be set down at ten thousand dollars, to which add whatever outlay is made for timbering. The cost of making the canal in the open country is estimated at two thousand dollars per mile—a figure likely to be exceeded on parts of the line. The total cost of the work on the basis of these figures would then be as follows: head-works, ten thousand dollars; tunnel, ten thousand dollars; five and one half miles of the fork of the canal, eleven thousand dollars; thirty-three miles of main fork to Bear Creek, sixty-six thousand dollars; twenty-two miles from Bear Creek to the San Joaquin, forty-four thousand dollars; total, one hundred and forty-one thousand dollars. To this is to be added the cost of six hundred feet of fluming crossing intervening creeks, including the Bear; also, of carrying the smaller fork from Canal Creek to the lands it is designed to serve, but this will not be considerable. The interests of the principal parties connected with the enterprise are served when the canal reaches Bear Creek, and there it may stop awhile, awaiting action of the farmers living between that point and the San Joaquin River. To Bear Creek the cost, according to the above figures, should approximate ninety-seven thousand dollars. It is stated that the necessary funds are already subscribed by the responsible parties, many of whose names are mentioned above, and the work is now in process of construction.

LOWER KING'S RIVER DITCH.

The People's Ditch Company of Tulare is an organization formed by the settlers on the lower King's River section, who are constructing an irrigating canal for the benefit of their farms. Water is taken from the river at a point ten miles above Kingston, by a simple head-gate without a dam. The course of this ditch, as laid out and now well advanced in construction, is to a point known as "Lone Tree," distant fourteen miles from the head. Thence to the lake the distance is seven miles, through which the work may be extended should settlers in that locality see fit to take it up. This ditch is laid out to carry four feet depth of water with a width at the top of twenty-five feet. Toward the head the banks are constructed with a slope of only one half horizontal to one vertical. At the same time the grade is considerable, falling at the rate of several feet to the mile, while at one point the steep rate of two feet in seventy rods was adopted. The material of the bank at this point is not of special tenacity. It remains to be proved by experience, therefore, whether the stability of the banks under these circumstances can be maintained, the detail of the construction being in violation of the rules laid down in the engineering manuals. The money for this work was raised by the formation of an incorporated company, with a capital stock of one hundred shares of one hundred dollars each. Each subscriber is an owner of one hundred and sixty acres of land, and their calculation is that each, taking an equal share of the water run by the ditch, will obtain sufficient for the irrigation of his quarter section. Whether or not they will find that they have all the water they would like, certain it is that each will get enough to repay him an hundred fold the amount of his investment in the enterprise. Although this work is not projected

on a plan to form any part of a general irrigation system, it does not interfere with such an one, and illustrates what may be done by the cooperation of a few neighbors in procuring present benefit for which they might, by depending on the construction of the greater works, have to wait for years.

UPPER KING'S RIVER DITCHES.

At Centerville, on King's River, twenty miles above Kingston, two small ditches have been partly constructed by the joint efforts of owners of land at that point and owners of lands of the San Joaquin Valley Land Association, lying between Centerville and the Town of Fresno, on the railroad. The principal of these ditches utilizes, for a considerable portion of its length, the channel of a small natural slough. The ditch is some fourteen miles long, about eight feet wide, and runs over a foot of water in depth. The amount of water supplied is, however, insufficient for the needs of the owners, outside of whom are a considerable number of settlers whose needs are equally imperative, while the settlement at Fresno, which is a growing one and will soon become an important town like Merced or Modesto, requires a copious water supply. A second small ditch running nearly parallel with that above described has been constructed for several miles. The settlers who are now without water propose combining with the citizens of Fresno Town and the owners of the second ditch to increase its dimensions, to alter its course so as to serve a greater area of country and to carry it into the town. These ditches get their water from King's River by aid of a small dam. Neither of these enterprises, however, even as projected, is adequate to the needs of the irrigable land of superior quality lying in this section, a very large body of which is on the west side of the railroad, of which the needs have not been considered or provided for at all. Nor could these become main parts of a general irrigation system. The labor expended on their construction need not, however, be wholly lost; whenever a general system shall be constructed, it is probable that these works could be utilized as distributing ditches.

CHAPMAN'S CANAL.

Between the Alabama Settlement, which is supplied with water by Mr. Friedlander's Fresno River Canal, heretofore described, and the San Joaquin River, bordering on the latter, lies a considerable area of fine irrigable land, owned principally by Lux, Miller, and Chapman. This is west, and some fifteen miles distant, from the Fresno Canal. To irrigate these lands a work known as Chapman's Canal, partly constructed last year, is in progress. It takes the water from the San Joaquin River, on the east bank, at a point twenty-five miles above Firebaugh's Ferry and fifteen miles from the magnificent railroad bridge over that river. No dam is used. The head-works consist of a flume thirty-five by thirty feet, founded on two rows of sheet piling. The head-gates work ten feet above the flume. The flume opens into a head basin of oval form, forty feet in the lesser by one hundred and twenty feet in the greater diameter. From this the canal, having a width of twenty feet, to run some three feet depth of water, proceeds northwardly, its course surveyed to strike the Cowchilla River at the Montgomery (Chapman's) ranch. Head-works such as those of this enterprise can be constructed at a cost of five thousand dollars. The canal itself may cost perhaps two thousand five hundred dollars per mile in average ground.

THE KING'S RIVER AND SAN JOAQUIN COMPANY'S CANAL.

The most extensive and important of these enterprises yet put under construction—a canal for navigation, as well as to supply water for irrigation—remains to be described. The San Joaquin River comes down from the Sierra Nevadas in a westerly course, and at a point a few miles above (south of) Firebaugh's Ferry makes a bend to the northward. The drainage of the great territory which empties into Tulare Lake as a reservoir, comes down thence northwardly during the period of overflow, through a line of main sloughs, and empties into the San Joaquin at this bend. The channel of this overflow, at the point where it empties into the river, known as Fresno Slough, always contains water, and during the season of high water is navigable to its head. Between the head of Fresno Slough and Tulare Lake are two other sections of deep channel, known as Buena Vista and Fish Slough. These, however, do not extend to the lake. If, now, the three isthmuses between Fresno, Buena Vista, and Fish Sloughs and the lake be cut through, a navigable channel becomes established from Kern County, at the southern end of Tulare Lake, to the junction of Fresno Slough with the San Joaquin River above Firebaugh's Ferry. Were the navigation of the San Joaquin permanent to this point, navigation would thus be opened from near Bakersfield, and embracing the magnificent lands known as the Tom Creek country, to the Bay of San Francisco. But at its lowest stages the upper San Joaquin is not navigable, the present head of permanent navigation being at Moore's Landing, near the crossing of the Western Pacific Railroad. To complete the chain of navigation outward from Tulare Lake, it becomes necessary, therefore, to construct a navigable canal from the mouth of Fresno Slough to Moore's Landing. This is the canal which the San Joaquin and King's River Canal Company have now under construction, and of which a large section is already completed. There still remains a section of some seventy miles to construct between the present lower end of the canal near Kreyenhagen's, at Los Baños Creek, and Moore's Landing.

In the San Joaquin River, near the mouth of Fresno Slough, is an island which divides the stream into two unequal portions—the western one being the smaller. From this smaller channel the canal takes its water by means of a dam of admirable construction. Across the main channel on the east side of the island a brush dam is thrown in order to maintain a full volume of water in the lesser channel. The canal dam consists of two rows of sheet piling, the space between them filled in and planked over. The piles are four inches thick. Upon this main dam as a foundation is erected a frame carrying gates which move up and down, the water flowing over their upper edges. Thus, when the channel is running full, by lowering the gates the entire volume of water is allowed to flow freely over the dam. As the quantity of water diminishes, the gates are gradually raised, maintaining the surface of the water behind them at a uniform level. The construction of this dam, like that of the Fresno Canal, was carried on last Winter at a time when the streams were running full, and involved some nice exhibitions of engineering skill. As an example of the class of devices resorted to in battling with the swollen torrent which opposed every portion of the work, one operation may be described. After the upper row of sheet piling had been driven the water boiled through between the piles, as well as over them, with such violence as to carry off the filling between

the two rows of piling as fast as it could be dumped in. To overcome this a sufficient number of stout sails were procured to extend the entire length of the dam. Heavy sand bags were attached to one end of the sails. A gang of men, as many as could stand side by side on the dam, strung the sails with the bags attached from one end to the other. A powerful current poured over the top of the piles, and against this the men slowly shoved the line of bags until it rested on the edge of the upper row of piling. At a word the bags were pushed over and immediately sunk to the bottom, the upper edge of the sails remaining attached to the top of the piles. The sails formed an effectual barrier to prevent the current pouring between the piles, and though the entire volume of water now flowed over the top, the operation of filling in between the two rows of piles was successfully prosecuted, and soon the main dam was completed.

This dam turns the water into the main canal through a sluice. The gates of this sluice also work so as to allow the water to flow over them. The advantage of this arrangement over that of allowing the water to flow under the gates, is that in the latter case the stream, under the pressure of the "head" behind the gate, is discharged into the canal at a high velocity, tending to cut away the banks; in the former case the stream tumbles into the sluice by a waterfall, the energy of which is expended in boiling around in the sluice, whence it flows into the canal in a tranquil stream.

The dimensions of the canal are: width at bottom, thirty-two feet; slope of banks, three horizontal to one vertical; depth of water, six feet; width of water at surface, therefore, sixty-eight feet. The banks are carried two feet above the surface of the water, and are made wide enough on top for a tow-path and foot-way respectively. Running in a line substantially parallel with the axis of the valley, the fierce winds which sweep over these plains from north to south throughout the Summer season raise a strong ripple on the waters of the canal, actually curling the waves over into small "white-caps," and illustrating with some force the old song anent "the raging canawl." This ripple is, however, a source of substantial inconvenience in washing away the adobe banks of the work. To counteract it, these banks are being lined with brush pinned to the bank with the butts upward, which has been found to give the needed protection. Up to the present date the canal has been run with only four feet depth of water; the work done this year, now approaching completion, has been to raise the banks so as to admit the full depth of six feet of water. The present lower terminus of the canal is at Kreyenhagen's, in Merced County, forty miles below its head at Fresno Slough, and seventy miles above Moore's Landing—the head of permanent navigation on the San Joaquin. Kreyenhagen's is one hundred miles from Antioch, in Contra Costa County. The canal company has proposed to the farmers and land owners between Kreyenhagen's and Moore's Landing, to subscribe a portion of the stock necessary to extend the work to that point; or if sufficient stock should be subscribed for, the work would be carried to Antioch—the more advantageous plan. Neither proposition has been responded to. The purpose of the company is to suspend further extension northwardly for the present. To the south, connection will be made between Fresno Slough and Tulare Lake by way of Fish and Buena Vista Sloughs, heretofore described, by cutting through the isthmuses which now separate those channels. Navigation will thus be established between the lake with the vast area of country accessible to it and Kreyenhagen's. When the

central canal shall be extended to Moore's Landing that country will be in communication by permanent water navigation with the bay and ocean.

These works have been constructed by Mr. M. Hangroom, civil engineer. Among the gentlemen prominently connected with the enterprise as projectors and builders are Messrs. John Center, J. Mora Moss, Henry Miller, George H. Howard, I. Friedlander, Charles Lux and others, to whom must be added Mr. J. M. Brereton, civil engineer, for some years past prominently engaged on the Government irrigation works in India. This gentleman, who is consulting engineer, projected the present works, and by his exposition of their advantages gave the impulse that led to their construction.

THE SYSTEM IN PRACTICE.

CANAL NAVIGATION OPENED.

The Californian who inspects these works for the first time will be fortunate if his first intimation of their proximity shall be the sight of a mast sweeping along the plain, a tow-line from the head of which, together with the familiar motive power at the end of it, shall quicken to his imagination with all force and consequences the grand fact that canal navigation has opened in California. The first four boats were constructed by the company for the transportation of their own material and supplies. They are built upon an English model, less cumbersome and "logy" than the American canal boat—dimensions, sixty-three feet length by nine feet eight inches beam. This boat carries sixteen tons weight to each foot of draft. A movable gunwale permits them to be loaded to a draft of four feet—*i. e.*, to carry a cargo of sixty-four tons. Thus loaded, they are towed with the stream (northwardly) by a single animal as rapidly as he can walk. Returning light, the same beast furnishes sufficient power to move the boat up stream. Larger boats of similar model have since been constructed. These facts, thus boldly stated, need no elaboration to enable the intelligent mind to grasp their bearings upon the "transportation problem" which still engages so much of the public attention. They show how the canal tends to neutralize distance from tide water as an element in the determination of land values; how it brings the rich river bottoms of Tulare and Kern Counties as near to market as many lands in the bay district itself; how it renders possible the profitable cultivation of small grains in regions where the advent even of the railroad still leaves the farmer hopelessly beyond reach of the export market. To the dwellers on the upper Sacramento it is not less important than to those on the San Joaquin, and points a significant finger to the direction which may profitably engage energies and resources that have heretofore spent unprofitable force on schemes of narrow gauge railway. California has made one great bound in the path of wealth since the opening of her railway era. Here we see, in the silently moving and heavy laden canal boat, the dawn of a second era, whose fruits shall be not less important than the first. Will they not, in fact, far transcend them in magnitude? Is it not plain that these two elements of transportation working together present the solution, in its full sense, of the problem which is before the country? The great bulk of produce from the soil, low in value to the ton, but aggregating millions of money in its many thousand tons, floats

with slow, uncostly motion to the sea; while the products of industry, charged with the value of the labor of many hands, and the busy population whose time is money, glide swiftly along the ringing rail. Words very imperfectly shadow out the full fruition of this new element in our progress—canal navigation—compared with the illumination which seems to flash upon the mind with the first ocular view of the accomplished fact.

IRRIGATION IN PRACTICE.

In describing the irrigation works, their two principal features—the main and distributing canals—have been explained. The next step is to consider the means and method for the actual application of the water to the ground. The first work of the farmer is to construct his own farm ditch. This lies wholly on top of the ground. The material for the banks is taken from outside their line, so that the water flows wholly upon the surface of the ground. The distributing canal from which the water is to be taken will always be higher than the highest point of the farmer's land. He will therefore be able to lay out his own ditch so that the water in it shall flow on the surface of the highest land he has to apply it to. The water will be discharged from the distributing canal into the farm ditch by a gate which will at once measure and regulate the amount of water delivered through it. To take the simplest case, we will suppose the surface to be irrigated to constitute a perfect inclined plane—as it would in fact on the west side of the San Joaquin—one hundred and sixty acres in extent, lying in the form of a square, each side a half mile in length. Then a ditch half a mile long following the western boundary of the field would serve to irrigate it. In the east bank of this ditch three gates would be placed, one at each end and one in the middle, distant from each other one fourth of a mile. From each of these gates a furrow is run east at right angles to the ditch to the opposite side of the field. As the ground slopes east at the rate of eight feet to the mile, it will slope four feet in the half mile, which is the width of this quarter section. And it will slope four inches in each two hundred and twenty-four feet—say thirteen and a half rods. Twelve times this distance reaches the lower side of the field. Throw up, then, with a plow, twelve ridges running north and south the entire length of the field two hundred and twenty-four feet apart, and each at least four inches high. These may be called "checks." To irrigate this ground, open the gates from the farm ditch and turn in the water. It will flow down the three east furrows. Throw with the hoe a little dam across each furrow two hundred and twenty-four feet east from the ditch—*i. e.*, at the points of intersection with the first "check." When the water reaches these dams it will back up till it begins to overflow into the field, where it will be held in the "check" till it stands four inches deep at that line, while its surface will exactly intersect that of the field at the foot of the ditch bank, distant two hundred and twenty-four feet west. The first belt of the field next the ditch having been thus thoroughly irrigated, clear out the furrow dams and hoe up three others two hundred and twenty-four feet east from the first, or at the points of intersection of the furrows with the second "check," repeating the operation till the field is irrigated throughout its length and breadth. In this, its simplest form, the labor of irrigation is inexpensive. How often the water will need be

applied in an ordinary season to make one crop, will be proved by experience. It is said by farmers on the adobe lands on the west side of the San Joaquin that four inches of rain, coming in the latter part of the season, is sufficient to make a crop. There is no obvious reason why an equal quantity of water applied by irrigation should not accomplish an equal result. In some of the successful experiences that were had last year, a larger quantity was consumed; but the fact is well attested that in these operations far more water was wasted than was utilized, through inexpertness in applying it.

The intelligent reader perceives that the method of applying the water to the land by this system of furrows following the line of steepest inclination, with "checks" connecting those furrows at right angles to their direction, is as applicable in all its detail to the "uneven" lands east of the San Joaquin as to the absolute inclined plane of the west side. The only difference in method is that diversity of directions to be taken by the furrows which was indicated in the preceding description of the "uneven" lands. The distances to be left between the "checks" and dams, to give equal depths of water at each irrigation, depends on the inclination of the surface diminishing as the degree of slope increases. If a greater depth of water be given at one time, the distance between the "checks" may be increased, but the distribution cannot be made equally uniform. Those portions of the field next above the "checks" and on which the water stands deepest, will absorb a greater amount than the more distant portions, on which it is shallower. By increasing this depth much above four inches, it would not be difficult to drown out a portion of the crop while another portion should fail to receive sufficient for its needs. Some irregularity of distribution is inevitable, but the nearer together the "checks" are put, and the less the depth of water given at any one time, the more uniform will be the effect. It is plain that the results of farming with irrigation, as of that without irrigation, will differ under the hands of different men; and that, in the one case as in the other, the more intelligent operator, and who is willing to give more downright honest work to his operations, will achieve the best results.

On the inclined plane lands of the west side the detail of applying the water may be varied. The farm ditch may be run on an east course, on which the land falls at the rate of eight feet to the mile. It will also fall away from the north side of this ditch at the rate of one foot to the mile. Main irrigating furrows run from this ditch both northeast and southeast will have a rate of inclination intermediate between these two—slightly greater for the northerly set, but the difference would be inappreciable in practice. These furrows could be run so that each northeast furrow from one ditch would meet the corresponding southeast furrow from the ditch next north of it. Thus an irrigating system would be laid out upon the whole surface of the ground resembling the skeletons of fishes, whereof the several farm ditches would be the backbones, each with its system of ribs attached, formed by the main irrigating furrows. This is, in fact, the plan that was adopted last season by the canal company in laying the water on the five thousand-acre field which they have rented as a sort of model farm from Lux & Miller. The water is applied through this system by the same method already indicated—alternately throwing up and hoeing out a succession of dams across the irrigating furrows, backing up the water in them till it overflows the adjacent soil. The proper series of "checks" produces the necessary uniformity of distribution to each part.

All streams flowing from the Sierras which are not charged with the mud from mining operations, bring with them extremely minute particles of inorganic matter. Stooping upon the edge of the stream, the sun's rays being in the right direction, some of these particles—probably micaceous scales—can be perceived. If a sufficient quantity of the water be collected and allowed to settle, this matter will be deposited as an impalpable slime. In this state it is the perfection of manure—the sustenance of plants in the form under which they can most readily assimilate it—the true fertilizing slime of the Nile. In seasons succeeding a general overflow of the Tulare streams the vegetable growths are of an exceptional luxuriance; the yield of cultivated crops reaches nearly incredible figures. Much of the soil that is thrown up to make the canal banks is light and sandy—at points, as in crossing old river beds—an apparently pure sand, which, it might be supposed, would be incapable of retaining water. Yet the water does not percolate through the banks, and when these are examined after the flow has continued awhile, it is found that the inner layer has become cemented together, and is as impervious to water as rock. The slimy material has filled the interstices between the particles of sand and compacted them into a solid mass.

REVIEW OF THE FIELD.

FUTURE OF THESE PLAINS—SOME DETAILS.

With the lights now before us, it is not difficult to foresee approximately the course of settlement by which these great plains will be developed. This will follow the desirable soils, keeping closely to those which can be relied upon to make a crop, and among such, preferring the lines of transportation, whether by canal or rail. These soils are: First—The heavy adobes of the west side of the San Joaquin River in general. Second—The adobe belt that crosses Stanislaus eastwardly, of which Modesto is near the center. Third—The adobe belt that crosses Merced eastwardly, of which Merced is near the center. Fourth—The broad tract of loam adjoining the railroad at Borden Station, in Fresno County (the Alabama Settlement), now irrigated by the Fresno Canal (Friedlander's), and the body lying east, irrigated by Chapman's Canal—under construction. Fifth—The still larger belt of loam that crosses the railroad at Fresno city, coming westwardly from the upper King's River Bottom at Centerville, embracing the German settlement (San Joaquin Valley Land Association), together with an extensive tract west of the road, all of which, to be made available, requires a canal of the first class from King's River. Sixth—The extensive and wonderfully rich (but feverish) loam bottoms of Tulare County, embracing lower King's River, the Four Creek and Tule River country, together with the vast adobe plains adjacent to Tulare Lake. Seventh—The still more extensive adobe plains and moist bottom loams of Kern County. By examining what is needed by each of these localities, and what is doing and in prospect of being done to supply such needs, the course of development and local progress will unfold itself.

THE WEST SIDE.

The west side of the San Joaquin, in general, needs (one) irrigation and (two) transportation. This area may be considered in three par-

cels—first, that north of the present terminus of the canal—*i. e.*, between Kreyenhagen's and Moore's Landing; second, south of Kreyenhagen's and west of the canal, between it and the hills; third, south of Kreyenhagen's and east of the canal, between it and the river. The whole of this section is supplied with transportation by the river during the period of high water, so that it can "get along;" the season is brief but long enough to get moderate sized crops out of the country. Still, for three fourths of the year, canal navigation would be a boon. Irrigation, the first thing needed, will come to that section of the plains first above named, whenever the canal shall be extended northwardly. The second named section will not get irrigation till another main canal shall be constructed from Tulare Lake down along the west foothills—a work of which there is no immediate prospect. The third section is that irrigable from the canal as now built. This area may be said to be ready for occupation.

THE EAST SIDE.

For the lands of the east side the railroad is the channel of transportation. If the farmers of that extensive adobe belt, whereof Modesto is the center, conclude to construct irrigating works, they have an abundant supply of water in the Tuolumne and Stanislaus Rivers. The next great belt of adobe at Merced can be irrigated from the Merced River, and works for this purpose have, as heretofore explained, been projected by local enterprise. But these two tracts can, perhaps, make a living without irrigation; they will hardly, however, grow rapidly rich. The extensive body of loam at Borden Station (the Alabama Settlement), is irrigated by Friedlander's Canal. East of this, near the river, and extending away northwardly to the Chowchilla, lies the extensive body owned chiefly by Chapman, Lux, and Miller, to be irrigated by the Chapman Canal. These two sections may also be described as ready for occupation. Next south, the still larger tract of choice land (valuable without irrigation), extending from Centerville to the railroad, and for a distance some miles west of it, seems to have no immediate prospect of adequate irrigating works. The two ditches previously described may be sufficient to enable the parties directly interested to cultivate their own lands, or a considerable part of them, but they are not even projected on a scale to serve the entire area; and until works of this character are in prospect, settlers will give preference to more favored localities.

THE TULARE COUNTRY.

The Tulare loam bottoms need only transportation for the development of great wealth; the adobe soils in some localities may need irrigation as an assurance against failure of crops. But there is a great deal of adobe in this county that can be relied upon to mature small grains with quite as much confidence as some other parts of the State that are regarded as in the first rank of agricultural lands. East of Lake Tulare there is more rain than on the plains north, and vast tracts of adobe lie so low and flat, being overflowed, or on the margin of the overflow, that they retain moisture sufficiently late in the season to mature crops of small grain. A good deal of the loam repays irrigation, but such as is needed can be had, and is being secured by local effort. Irrigation works of an extensive sort are not prerequisite to the development of large wealth in Tulare. But cheaper transportation is

essential to rapid development. Tulare lies beyond the reach of a profitable export market by rail. The prospect, therefore, of the establishment of canal navigation between the lake and the lower San Joaquin is, to Tulare, an opening of the door to wealth and development unlooked for, if not undreamed of. There will remain to this section only the drawback of the fevers that prevail over much of the richest lands. These may deter settlement. The irrigation works proposed in this county take mainly the form of leveeing the lakes and rivers, preventing the periodical overflow, and thus tending to obviate the cause of malaria. It is from this point of view that the proposed works are, perhaps, most important to that section of country. When these works shall be accomplished, if not before, it is not difficult to see that Tulare will become, in some respects, what portions of Louisiana were before the war, the seat of an exceptional wealth, and prominent even in this favored State, for the variety and luxuriance of its productions.

To Kern County, the general remarks made of Tulare, are applicable. "The Island" (so-called) whereof Bakersfield is the business center, can scarcely be rivaled in the State for richness of soil, and for a climate calculated to urge every product to the most prodigal development. But the stranger shrinks from the malarious influence which the execution of judicious irrigation works would be calculated to mitigate and in time eradicate altogether.

SUMMARY.

The foregoing review has developed the conclusion that, with the exception of two localities, the works essential to the immediate development of the great southern interior plains are under actual construction, and will be completed for the present planting season. These exceptions are—first, that part of the west side of the San Joaqain lying north of Kreyenhagen's, and second, the loam belt on the east side that crosses the railroad at Fresno City. Modesto and Merced can live along without irrigation, and can readily get it if they conclude that they want it. The loams of the east side at the Alabama Settlement and Chapman's, are supplied. So is the adobe next the river from Firebaugh's north to Kreyenhagen's. The Tulare country does not need irrigation in the main, but does need canal transportation, and is in the way to get it. It more needs to have its waters leveed within their banks, and it is "on the cards" that that will come among the first new developments of the canal and irrigation system. The area of land to which water for irrigation is actually supplied this year is some one hundred and fifty square miles. Of this, the area supplied by the San Joaquin and King's River canal as now constructed—*i. e.*, the area lying between it and the San Joaquin River, extending from the head-works to Kreyenhagen's on Los Baños Creek, is forty-eight thousand four hundred and ninety acres. The extension of the canal, north, will cause it to intersect the Western Pacific Railroad at a point near Ellis Station. The irrigable area between this point and Los Baños Creek, the present terminus, is one hundred thousand six hundred and seventy-eight acres. Of equal significance are the areas served by the canal as a channel for transportation. To ascertain these, add to the area commanded by it for irrigation, that of a strip three miles in width on the western or upper side of the canal. We then have to add for the section already completed sixty-nine thousand six hundred and thirty-two acres, making a total, with those also irrigable, one hundred and eighteen thousand one hundred and twenty-two acres. If the canal be extended to Ellis Station, a further area will

be served for navigation equal to one hundred and thirteen thousand seven hundred and eighty-eight acres, making a total, with those also irrigable from the same extension, two hundred and fourteen thousand four hundred and sixty-six acres. With the completion of the canal southwardly to Tulare Lake, it will serve for navigation, adjacent to its banks, the further area of seventy-four thousand one hundred and thirty-three acres. But, it is to be remembered, by establishing a connection with lake navigation the whole vast area of Tulare and Kern Counties, adjacent to the lake, are equally brought within the benefits of canal navigation. The total area contiguous with the canal which it would serve for navigation, between its point of union with Tulare Lake and Ellis Station, would be four hundred and six thousand seven hundred and twenty-one acres—a figure, it may be added, so great, that it conveys to the mind no definite idea of area. Its capacity, when all cultivated under irrigation, may be stated as equal to that of any equal number of square miles of the richest virgin soil ever turned in California in its most favorable season. The area hitherto beyond reach of market, to which a market is to be brought by canal navigation, is some two hundred and fifty thousand or three hundred thousand acres of the very richest and most productive soil in California. Concerning the larger features of a comprehensive canal system for the entire State, with a main lateral canal along the foothills on each side of the plains, it is obvious that the one projected for the east side can wait; most of the good that it could accomplish is in process of being accomplished by the minor works already in progress or in prospect. The main canal on the west side could be executed with advantage, creating a high value upon nearly every acre of the vast plains upon that side of the San Joaquin river. The leveeing works proposed in Tulare County would tend to remove the last drawback upon what is already both the richest and loveliest spot on all the surface of California.

SHEEP RAISING.

THE ART OF SHEEP RAISING

FOR

WOOL, MUTTON, AND MONEY.

PRACTICAL DIRECTIONS FOR BREEDING AND HANDLING SHEEP IN CALIFORNIA WITH REFERENCE TO DIRECT PROFIT—SHEEP WORK FOR EACH MONTH IN THE YEAR.

BEING A SERIES OF PAPERS WRITTEN FOR THE SACRAMENTO DAILY RECORD AND RECORD-UNION, BY A. A. RITCHIE, OF GUENOC, LAKE COUNTY, CALIFORNIA, BREEDER OF SPANISH MERINO SHEEP.

SHALL I BUY SHEEP?

Sheep raisers may be divided into three classes: First, those who make sheep breeding, for wool and mutton, their main business; subsidiary and auxiliary to this, they may do more or less general farming. Second, those whose main business is general farming; subsidiary and auxiliary to this, they may breed a greater or less number of sheep. Third, those who raise thoroughbreds—who look to the sale of bucks at fancy prices as one of their leading sources of profit. These three branches of one business are usually prosecuted under such different circumstances as to be almost three distinct things. Yet, success in each requires very much the same sort of attention to the same sort of details. Underlying it all is the proposition that increase of lambs is increase of wool and mutton. Here is where the money is really made in sheep-raising. And when once embarked in the business, the first thing to be learned is the detail of so handling the flock that the fullest increase may be insured. But with many, the first question will be: Shall I embark?

In the course of this series of papers I shall endeavor to so fully explore the whole ground that one who has never worked in sheep will

be able to decide for himself whether or not his circumstances are such that he can advantageously undertake sheep raising at all, and if aye, then to what extent. But in this place some general hints only can be thrown out. I have said that increase of lambs is at the foundation of success. Proper care and labor expended during the lambing season is the warrant of this increase. To bestow these some knowledge of sheep nature is requisite. This knowledge is soon acquired through observation by one whose heart is, even in small measure, in the work; who can come to feel a personal interest in his sheep; but unless one be conscious that he has it in him to take this interest and to acquire this knowledge, he will never make much of a sheep man.

After this consideration, the first will be—range. The natural sheep ranges of California—those where the business can be best undertaken as a specialty—are the foothills both of the Sierra Nevada and the Coast Ranges, and those parts of the plains that are beyond the reach of a profitable market for grain growing. Except for raising thoroughbreds, valuable grain land cannot be profitably ranged to sheep. These considerations practically exclude the business from many farms which have no hill range. It is true that every farmer can profitably raise his own meat. Where Summer fallowing is done the fallow always brings more or less "foul" stuff, that makes good feed for sheep—which, in turn, leave the land in all the better condition for grain by cropping down the foul stuff, preventing its seeding, besides converting it all into manure. But the most profitable way of feeding off this crop is to buy the necessary number of lambs from some sheep breeder, let them work off the fallow, the stubble, and everything else on the farm, till it is clean, then turn them over to the butcher. A first class crop of good weeds is wasted every year in California for lack of feeding down in this way. But this is not sheep breeding. It is true there are farms on which the amount of land Summer fallowed is so large that it will carry a band of several hundred sheep, which, by working during the odd whiles on young volunteer and the like, can get good picking the year round. Under such circumstances it may pay to raise lambs instead of buying them. I may remark, too, that many a farmer sells off a lot of indifferent hay at a price that really leaves him nothing over the cost of marketing it, when it happens that he might buy a band of lambs and get a good advance by turning the hay into mutton. But this is allied more nearly to the side subjects of "stall feeding," or "soiling"—which I do not propose to discuss. And, again, much good meadow land—too wet and cold for regular grain growing—would bring on a band of lambs well, that pays but a trifling rent as Summer range for cattle. All these, however, are still not sheep breeding; and I may say in general that, within the area of profitable grain growing, a man is not expected to go into this business with success unless he has some hill ranges that will not pay to plow. Nor, I may add here, will it pay to make feed—not even to cut wild hay, on which to keep and breed sheep—except (in a measure) for thoroughbreds and other high grades.

There used to be another condition attending the business which is fast disappearing—that of ranging sheep on Government land; sometimes the range was secured by securing the water; sometimes neighbors merely scrambled for what each could get. Once, indeed, this was the general case, and the exception was when a man owned his range; but now, he generally has to own it, and too often fence it, too, if he would have much good of it. There are large breeders now who range their bands during the Summer on the high mountain pastures, and come

down for the Winter to ranges which they hold on the plains; some, indeed, cross over into Nevada; but these are both special phases of California sheep husbandry, on which I shall have little to say.

Having decided that he has some range that is suitable for sheep, the novice may next desire advice as to what breed or breeds he had better buy. The whole question of breeds will be considered later, from our California standpoint. Lambs to be fed as above suggested, on Summer fallow, or meadow, ought to be of the large-bodied breeds, Lancaster or Southdown. But ewes to be bred on hill range ought, in nine cases out of ten, to be moderately high graded Spanish merino, *i. e.*, ewes which have been "bred up" from American stock to at least three fourths Spanish. This might have been accomplished by two successive crosses with thoroughbred bucks. Some breeders believe that the grade thus produced will not commonly be as "even," nor breed as "even," as a grade that has been brought up more gradually, for instance, by first crossing with half-breed bucks, producing one quarter bloods; these again to the three quarter bucks, producing half breeds; these again to thoroughbred bucks, producing three quarter Spanish. And if the process of grading up has occupied one or two years more, the band should, according to this opinion, be the better for it; should give a more even quality of wool, which would sell the better for that reason; should bring a more even lot of lambs, requiring less culling out; should possess and transmit those "points" of the thoroughbred stock which are esteemed because known to possess some quality of value, more uniformly than a band in which the "blood" had been more precipitately injected. I do not indorse this notion, for I have not been able to notice facts tending to support it, nor to obtain from others what I could regard as proof of its soundness. Of course a flock is bred up quicker by using thoroughbred bucks, because four years of crossing would have brought the last lambs up to thirty-one thirty-seconds "blood," instead of to three quarters, as by the breeding suggested; and two more years of crossing would bring lambs one hundred and twenty-seven one hundred and twenty-eighths "blood," which is tolerably near thoroughbred.

But to one point the beginner may yield implicit conviction. Any one hundred well graded ewes (I should say not less than three quarter breed) of whatever breed, costing say five dollars a head, will give a larger profit than any one hundred and fifty or more common ewes that can be bought for the same sum of money. I may concede one exception (which is not an exception, to speak Hibernice)—that is, where the range is a Government common. Then there is a real profit in getting away with all the feed that your stock can nip, and therefore in putting on all the stock you can to nip it. For this work it may be permissible to use the cheapest stock; and even in this case, the better sheep will convert the same feed into better wool. But aside from this case, and confining ourselves to those of men who expect to work on their own range, I can say I know of but one poor investment in sheep—and that is, an investment in poor sheep. A man may have range for five times the number of sheep that he has money to buy of high grades; he has then to choose between stocking his range full with common sheep (to grade up, of course), or to start with the less number already well graded. Even then, in the greater number of cases, the better sheep will have yielded the larger profit each year, while, at the end of any given term of four or five years, the profit existing in the then condition and quality of the flock will be much greater. *Experto crede:* I have been there!

There is one other bad purchase that may be made and which generally offers during a "bad sheep year"—that is, a season when feed has been scant and sheep are thin and weak. The Autumn of such a year seldom passes without chances offering to buy a band of ewes at "a dead bargain." Don't. It is odds that by the time lambing is over, the purchase will be as dead as the bargain was. At all events it is nearly inevitable that the bargain will have proved a bad one; and will be perhaps at its worst if the purchaser thinks he have learned the lesson that "sheep don't pay." While carrying their lambs, ewes ought to have at least decently good feed, and to be in *good* strength at lambing time—of all times in the year. Without this, no amount of care will insure that full increase of lambs that I have said lies at the foundation of real success.

There is one other point in buying a band of ewes supposed to be with lamb. The lambs ought all to come within a period of six weeks. To insure this, the ewe flock ought to have been served by a sufficient number of bucks. This number may vary according to the sort of range and quality of feed the flock was on when the bucks were turned in. In general, and on good feed, there ought to have been at least one buck to every fifty ewes, and if yearling bucks were used, it is safer to have had a greater number. Some breeders pamper their bucks up well before turning them in, feed grain for awhile, etc. Where this has been done, bucks may do double and treble duty. By proper inquiry, a purchaser can find out a good deal about the past management of the band he proposes to purchase, and had better find out all that he can.

I said that due increase of lambs is to be insured only by proper care bestowed during lambing time. Sheep will live and thrive and do well in most parts of California with little care during nearly eleven months of the year. I speak now of small bands—farmers' bands. On a sheep ranch the work, such as it is, goes on with them the year round. But there is a period of six weeks to two months, during which some real work must be given to sheep even by small growers, as the price of real success with them. This is the lambing season. With some growers in the southern part of California, this season is already past; lambs may come there with advantage, on suitable range, as early as November; on more ranges, it is not found safe to have them come before December. In the central part of California, it is better to have them come in January and February; nor is it well to have them come in any part of the State that is really adapted to sheep raising, later than March; for as the feed gets dry towards the first of June, the ewe's milk begins to fail; the lamb's growth is thereby stunted; it becomes a "runt;" so that it has passed into a saying with sheep men that "one January lamb is worth two March lambs." Besides this the lambs' fleeces are to be shorn as early as possible in the following Autumn—and this ought not to be later than the middle of September; it is decidedly better for the well-being of the lambs that shearing should be done before the end of August; they acquire thus a serviceable coat against cold, raw weather, when, also, the feed is at its poorest. But March lambs give but a light shearing in September (six months old), and the staple is so short that it fetches a low price per pound. The following Spring, again, the yearlings are shorn with only a six months' fleece—light of weight, short of staple, low in price. In short, starting with late lambs, the business is prosecuted with disadvantageous aspects, all through. Starting with reasonably early lambs, on the other hand, which come in January, February, all these aspects are reversed. Discussion of the proper methods

of managing this matter, which is here only glanced at, belongs to a later paper of this series, when I come to the season for putting the bucks into the ewe flock, in (about) August. I have meant only to show in what sense "lambing" may be appropriately taken as January work. At whatever season it comes, however, the work of the flockmaster will be substantially the same—especially that part of it which consists in proper "handling" of the sheep. The lambs are to be looked for in one hundred and fifty-one or one hundred and fifty-two days from the date when the bucks were turned in to the flock; the first buck-lambs may not appear for a day or two after the lambing begins; and we assume the number of bucks used to have been sufficient to insure all the ewes lambing within a season of six weeks.

The best level land and feed should have been saved for lambing. At least one shepherd, who can be relied on to stay by the sheep through the season, should have been secured, and ought to begin his work with the ewes at least two weeks before lambing begins, for sheep are nervous with strangers. The necessary corral or corrals should have been provided.

THE CORRAL.

CORRALS AND PENS FOR LAMBING.

The corral for the flock of lambing ewes cannot be too large; neither can it be separated into too many divisions. But the question with the beginner may be—what amount of corral is necessary? I have found that it is possible to work with a corral giving only about one square yard to each ewe in the whole flock. On ranchos where large bands are ranged, the lambing corrals are made with movable fences.

The material is ordinary fencing stuff. Each panel should be sixteen feet long and four feet high. The end pieces should be about four inches longer than the spaces into which they are to be inserted, which will allow them to be worked easily, as the fence is to be set up, or taken down, with no danger of their becoming unlocked by accident. The vertical pieces are double—one on each side of the horizontal boards. Rivet all together, or—as will serve not quite as well—nail strongly with twelve-penny nails, previously burned to admit of clinching; and a set of these panels can be made to last for years without repairs. One panel out of every four should have a gate about eighteen inches wide. Nail the vertical boards forming the gate to the two middle boards of the panel only, which will serve as battens; then saw these off, put on a pair of butts and a hasp, and the job is complete. With these panels pens can be set up when wanted, alongside or within the lambing corral; or should it be found useful to accommodate a few ewes or lambs, or both, in the barn or under a shed, the needful pens can be set up without delay. The panels come into play the year round. With them the grain stacks can be fenced when it is desired to turn the sheep early on stubble; they can be used in Summer to fence a dry arroyo that during Winter may run a stream of water that prohibits permanent fencing. Four panels set together make a pig-pen, and it is a good plan to set up the pen this way on different spots about the orchard, or the garden ground, beside being rid of the nuisance of a sty permanently on one spot. But, really, there is no enumerating the uses for which these fencing-panels come in.

On a large sheep ranch there is a headquarters, commonly called the

"home place," where the shearing corrals and other permanent works are erected. However these be constructed in their other details, it is well to have them so arranged as to be used for "parting" a flock at all times. This requires only that there be arranged in connection with the main corral a lane—say fourteen inches wide—with the gate at the end of it. As the sheep come from the corral up the lane, in single file, they may be parted by swinging the gate to one side of the lane or the other, to enter either of the inclosures, as may be desired. Permanent sheep corrals ought not to be used for any other stock, and a good way to insure that they shall not, is to mortise into the gate posts at the time they are set, a stout cross-bar at a height of say three and one half feet from the ground. This will exclude neat stock and horses, and avert the danger of having to get up panics amongst the sheep at night, turning such stock out. Again, on the plains bands of this stock are brought along from time to time, and the cattle men—who do not understand why their stock is a nuisance at a sheep camp—ask to corral them for the night. The favor cannot well be refused; but your cattle friend will hardly ask to knock the corral down for his accommodation; and if the gates be all closed, as above suggested, his cattle cannot get in without knocking them down. On such ranches, the best feed at lambing time is as likely as not to be away from the home place, and the lambing will be done where the best feed is. Permanent lambing corrals cannot, therefore, be erected on these places, and the more complete the preparation for setting up a good set of corrals and pens where they may happen to be wanted, the better.

The details of lambing corrals may be endlessly varied to suit circumstances, especially in adapting the corrals that may be already on a farm, to lambing purposes. I have indicated the general idea that may be aimed at; the description of the lambing work, which follows, should do the rest.

LAMBING.

PARTING OUT.

A week at least before the first lambs are due, the wethers, barren ewes, and yearlings, are to be parted out from the ewe flock. This is the first lambing work proper; and it is to be remarked right here, that in this and in all other sheep work, they are not to be frightened nor chased about, under any circumstances. The sheep is the most timorous of domestic animals, and, to those who are strangers to them, appear to have the least sense. Though hardy in one sense, they are not difficult to injure—especially ewes that are big with lamb. At this time, care and watchfulness, and a patience that knows no exhaustion, are requisite in dealing with them, especially by the novice who has yet to learn "their ways." The corral and pens that we have prepared are expressly to avert the necessity of panics, and of knocking the sheep about. In catching a sheep, endeavor to throw the left arm around its neck, clapping the right hand on the rump, when you have it under complete control. Missing this, slip up and take it by the hind leg. Never plunge the hands into the wool, and hold the animal as it struggles. It is no exaggeration to say that the effect of this is the same as of so many pulls at one's hair; the place is seen to become bloodshot, and the trick is simply barbarous. From first to last, there is not an operation necessary to be performed that cannot be accomplished without rough-and-

tumble work or frightening the sheep, which is always liable to bring disaster on lamb or ewe, or both.

"Parting out" a band of sheep is best effected by means of a "chute." This chute may be advantageously set along one side of the lane by which the sheep leave the corral, and they may be allowed to pass out through it for several days before parting. This may save a good deal of trouble in inducing them to go through the chute when you wish to part. The lane itself may thus serve as a pen to part into. The chute saves much work to shepherds and injury to ewes. With small bands, and proper pens, all chasing of the sheep about can be avoided even without a chute, but the work is greater. When proceeding to part out, there should be no one in the corral but those to whom the sheep are accustomed, for they fret with strangers about them. They should have been accustomed to come out of the corral in the morning of their own motion, never being driven out, when they will have learned to do so at an easy walk; thus you have no crowding and jamming. Keep everything away from the corral gate that may flurry the sheep after they come out, or start them into a run. A band with these habits will quietly take up their single file through the chute when it comes to be set for them, and so each one comes to the gate; this is closed or opened, turning the sheep out at the side or allowing it to pass through, as the case may be. Having thus separated out the ewe flock by itself, the other sheep are to be kept off on separate range, so that the bands cannot mix again, till lambing be over.

LAMBING.

We now suppose lambing to begin. Always be "on hand" in the early morning, when most of the ewes will be found lying down. Now try and get the run of things, before the ewes get up. Some of the ewes that have lambed during the night will have got their lambs cleaned off, suckled, and lying quietly down by their sides; others will be cleaning off their lambs by licking them; others will be in the act of lambing. Some will have two, three, and may be more lambs about them, and will apparently own them all. Another, perhaps, a yearling, with her first lamb, may be backing off from it, though at times apparently quite fond of it; it is likely her teats are stopped up, though sometimes from "the novelty of the thing," she does not allow it to suck. Yet others will be seen with blood about the breach, or part of the after-birth hanging to them, but with no lamb that they appear to own. All of which you must keep the run of—or at least try to; and it will keep two "old hands" busy to do so with a flock of one thousand ewes; the novice, with a good shepherd to help, will find his hands particularly full with five hundred.

The gate may now be opened, when, as I have said, the flock ought to pass quietly out—those with lambs staying, generally, behind, when close the gate on the ewes and lambs. Should you stop some who have not yet lambed, no harm is done, as you can let them run by you when chance offers. But keep a sharp lookout for any having signs of lambs but none with them. Some of this sort are very apt to offer to start out along with the flock, and some are particularly apt to get by you in spite of care. Among these, too, will commonly be your hardest cases to deal with, and once in a while one that will baffle all your efforts to make her take a lamb and own it. In a large band, a ewe with a lamb that is strong enough to walk may slip out along with the main flock.

A young or nervous ewe that has lambed, and—following the flock from force of habit—has slipped through the gate without it, may now miss it, and offer to come back for it, when she can be let into the corral. But this is less apt to happen if the bad practice has been followed of opening the corral gate the first thing in the morning, which some sheep shepherds will do—even before looking through the flocks. Opening the gate starts the sheep, and if the morning be at all cold or frosty, instead of stopping to feed off, as they ought to do, they will start off and keep moving. Thus before a ewe may miss her lamb, she will be apt to be so far away from the corral, that instead of turning back she keeps with the flock. The chance is thus lost, too, of parting out ewes who may have got out with or without their lambs. But this is not the chief evil of starting the sheep too early. That animal, like every other, has its own way of taking rest, and part of that rest consists in lying down and chewing the cud—in the morning as well as at any other time. So let them take their time, for whenever a part of the flock is started by opening the gate others will follow sooner than they would have done of their own motion. And now they will begin to feed as soon as they are out of the corral, and move off slowly—which they ought to do.

REGULATING EWES AND LAMBS.

When satisfied that you have got out of the main flock all the ewes that have lambed, the next work is to regulate matters in the corral, and see that each ewe has her own lamb or lambs. This can be known in various ways. The ewe will allow the lamb to suck her, will caress it after her manner, and will, generally, try and take it off by itself. If she have two lambs that appear to be twins, you, first thing of all, count the ewes and lambs before you admit that any are twins, being sure that you have all the ewes that have lambed the previous night; you may next pick up one of the apparent twins and hold it awhile; then take the other one in the same way; if the ewe is contented with each singly, it is pretty safe to conclude that she owns both; but if she disown either by itself, you infer it is not her lamb. If she own them both, you are to take a simple precaution against her afterwards disowning one, by simply putting a distinctive mark on the pair. A daub of tar on the right side for one pair, on the left for another, or different kinds of rags tied around the neck for others, will suffice.

At this first stage of lambing, the ewe is controlled completely by her sense of smell, and even when her lamb is a week old, she may run about and smell fifty different lambs, passing within two feet of her own, which may be the only black lamb in the flock. The marks above described are not to assist the ewe in identifying her twins, but to assist the shepherd, so that he can help each to find the other. The advantages that can be taken of this peculiarity in inducing ewes to adopt lambs will be seen.

Next take in hand the manifest cases of mother and infant, as of a ewe who owns a particular lamb but will not let it suck. Catch her and examine her teats; if they be stopped up, "the teats and bag should first be well worked as if to milk them; bits of scurf or dead skin that may clog the orifices may be picked off. Usually the teats can be opened by these means, nor should the effort be given up until it be quite apparent that it is unavailing. When opened, they should be milked till the bag has become softened in all its parts, and especially it must be looked to that any hard lumps which may have formed in the bag, are dispersed.

As a last resort, the teats may be opened by running a red-hot needle into the orifices. These stoppages are often due to the ends of the teats having been nicked at shearing." She may be only young and shy; catch and hold her while the lamb sucks. Occasionally she will not take the lamb, no matter what you do; then, if she be in good condition, has milk, and acts so out of "pure cussedness," mark her for the butcher; or if you happen to be raising fine sheep and she possesses some extra "points," she may be given one more chance. Do not fail to make a note of her case at the time. You will then have to make a mother for the lamb.

Or there may be another manifest case of mother and infant, in which the fault lies with the lamb, a weakling, or "discouraged" by cold or hunger so that it will not suck. It is to be taken up and warmed. Some sheep men dose it with a spoon and some stimulant, but a thorough warming and drying off, with a few drops of milk milked into his mouth, will do the work; if needful, hold him up to the teat for awhile, and you may at the same time scratch him with the finger at the root of the tail or such places as the ewe would lick him, and he will wag his tail and begin to suck at once—taking courage from the caresses and help which he imagines the ewe to be giving him.

Some writers tell of European shepherds burying lambs up to their necks in a compost heap and allowing the heat generated by decomposition to warm them. I have applied this plan with success to full grown sheep that have become chilled as a consequence of late shearing and emaciation, but with young lambs I would adopt it only as the last resort, for if there were any number of them it would be a first class job to make their mothers own them again.

MOTHERLESS LAMBS.

Next, proceed with the "motherless lambs"—a term used to designate such as none of the ewes appear to own. If the lamb has not been cleaned off, you may suspect it of being one of twins, which has got separated from its mother. This is not unusual, for the ewe will sometimes get up during her pains and move about; other sheep may move in between her and the lamb; or, if a strong one it may stray off, and when its mate is born the ewe devotes her whole attention to the last one; the first one gets dried off, probably is knocked down two or three times, and in the dirt of a corral soon gets so disguised in every respect that it is not strange the mother disowns it.

Or the lamb may not be one of twins; then, if the mother be present, careful observation will commonly disclose some indication on her part of a preference for the lamb. Both may then be caught and held while the lamb sucks; sometimes this will be enough; or they may then be put in a small pen together. At this time if the ewe be startled, as by the appearance of a dog, a child, or any other kind of fright, her maternal instincts are often aroused, and she stamps her foot and demonstrates in defense of the lamb; after this, she may consent to own it. But if the ewe resist all management, being in good condition and having milk, then—as I said before—mark her for the butcher.

Mothers have now to be made for the motherless lambs. First, find out if there be a ewe whose lamb was stillborn, and who still stands over it. Skin the dead one, put the skin on the live one like a horse-

blanket, rub it with the skinned carcass over all the parts not covered by the skin, remove the carcass out of sight, and the mother of the dead lamb will own the live one almost immediately. In a few days the skin may be removed, the trouble is over, the adoption final. If there be no stillborn or dead lambs, and the ewes are in condition to suckle twins, any motherless lambs remaining undisposed of may be kept until a ewe is found in the act of lambing; then slip up quietly with the motherless one, roll it about in the water and after-birth, and the ewe will clean them both off and own them both. Should she have twins you will have to "try, try again."

Sometimes a very strong lamb will get along by itself, stealing from the ewes indiscriminately. And finally, all other plans having been faithfully tried and failed, there may be no other recourse but to feed them by hand, or give them to some neighbor's children. Both plans are open to objection. Where sheep are kept in large bands in California, the "camps" are seldom provided with milch cows; and giving away lambs soon starts an opposition sheep ranch--to divide with you any unfenced range you may happen to work on.

There will be lambs coming at all hours, day as well as night. Those that come during the day are to be worked out of the main flock and put in with those that were parted out in the morning. They require the same sort of care and management to see that mothers and offspring are duly mated.

MIDWIFERY.

There will occasionally be a ewe that may have such trouble bringing forth her offspring as to need help. This happens very seldom, and nature should always be allowed ample time to do all she will before you offer to interfere; the ewe being several hours in pains need not appal one. The lamb ought to come head-foremost, with the two front feet one on each side of its nose. If it be coming right, but on examination prove to be dead, then after unusual delay, assistance may be offered. Lay the ewe on her side, and as each effort of nature is made to expel the lamb, you may pull at it gently. Be particular to pull only when a labor pain is in progress. A few gentle and steady pulls will suffice in most cases. It may happen that this has to be done when the lamb is alive, but this will be still more seldom, unless an injudicious cross has been made, as of a small Spanish ewe bred to a buck of one of the large English mutton breeds. This crossing is a pregnant source of this trouble. Occasionally the fœtus may have died, and though the ewe may have been in labor ample time, no sign of its appearance may be visible. An examination may then be made by introducing the fingers (well greased with lard), and if the lamb can be reached, it may be extracted. As before, the operation should be performed gently and gradually.

Inversion of the uterus sometimes follows parturition—that is, the uterus turns inside out, like a glove drawn from the finger, and protrudes. This is to be attended to at once. Lay the ewe down, return the uterus to its normal condition as well as you can, and restore to its natural position. This is upward (toward the backbone) as well as inward, and about as far back as the fingers, with so much of the hand as will be admitted, can succeed in pushing it. This is a tolerably difficult operation all through. In performing these operations, take care not to scarify any of the parts with the fingernails.

Old writers on sheep talk of dissecting the lamb and taking it away

piecemeal; also of performing the Cæsarian operation, and of other surgical performances. I have never attempted anything of the kind, and believe that the operations described above are all that the ordinary sheep breeder need expect to attempt.

THE LAMB FLOCK.

The first day both ewe and lamb want perfect quiet. They are to stay in their own corral, and on the following day to be moved off, in charge of the most trusty shepherd, on to their own range—near at hand, but out of sight and hearing of the main flock. This lamb flock is to have a separate corral to sleep in. Each day the new lambs with their mothers are to be driven into the lamb flock; that is, on the third day, the second day's lambs are to be added; on the fourth day, the third day's lambs; and so on.

The lamb flock wants constant watching and care, and twin lambs especially need help much longer than many would be apt to suppose. When the mothers have come to know them beyond peradventure, the rags or strings that have been put on them as marks may be removed. Sometimes a lamb will lie down to sleep, and its mother feed off with the flock some distance—more particularly if it be a twin, and the other lamb move away with the ewe. When the lamb wakes it is as apt to wander one way as another. And as for driving it, the plan has been recommended of getting between it and the flock, when it may chance to charge in the right direction—betwixt one's legs. It is best to catch the lamb napping, take it near the flock and lay it on its side, holding it down with your foot or a stick. It will shortly bleat—or you may play lamb and bleat yourself; some of the ewes will be attracted, and answer; as soon as any of them start toward you—no matter whether it be the lamb's mother—release the lamb and run off; for as soon as he collects himself he will make for the object nearest him.

A sharp lookout must be had for squirrel holes, or any rocky places. Little lambs are quite helpless, should they fall on their backs or even go headforemost into such places. After the first few days they play and run a great deal, and any rocky ridge or the bank of a ditch appears to possess peculiar attractions for them.

About this time some of the lambs will become clogged up, by excrement adhering to the tail and the wool around the breech. This "wax" (as it is termed) is to be removed, and the place rubbed with powdered chalk. Dry earth is perhaps quite as good for this purpose, and its peculiar quality as a deodorizer may render it better. Some sheep men dock the tail then and there, but it looks ugly, and should be left till the time of castration.

CASTRATING.

Have a small pen, in which to put the lambs by themselves. If the lambing pens have been made of movable fence-panels no other preparation will be needful; otherwise such a pen must be prepared—its fence not more than four feet high. Select good, mild weather. The person castrating stands on the outside; the assistants get inside to catch and hold the lambs for the operation. The lamb is to be held up, with his back against the assistant's breast, who holds its right fore and hind legs with his right hand, and its left fore and hind legs with his left hand. By a slight pressure, or pulling the lamb gently toward him, the effort made by the lamb to contract the spermatic cord is overcome. Now

remembering that quickness and dispatch constitute the one secret of success, cut off the end of the scrotum, pull out the testicles "root and all"—after which you cut off any end of the cord that may have broken off long enough to hang outside. Some operators now apply a salve; tar rubbed up in lard is used by many; others prefer sulphur and lard. I have got my best results by promptly driving the lambs with their mothers through running water that the lambs can just get through without swimming. This washes and appears to "cool them off." Any little bunches of lambs running about the corral after castration should be stirred up and encouraged to go with their mothers. For "docking" and "marking" which accompany this operation, see further on.

Occasionally, but very rarely, whether from hernia or other cause, a lamb will be detected with the entrails protruding from the wound you have caused. This must be washed off at once; turning him on his back, the intestines are pushed gently back again and a stitch or two taken with needle and thread. With ordinary luck, the lamb will be saved. This protrusion sometimes takes place long after castration and after the wound has healed up. The lamb is then among shepherds termed a "busting," and may be mistaken for a ram. Lambs sometimes bleed badly. I do nothing for it. I never had one bleed to death. The moon is held by many professional (and intelligent) shepherds to influence the success of this operation. Of course, I have not been able to detect this influence—but may remark that if the shepherd in charge of lambs makes up his mind that they are going to die, they are apt to do it; and if he make up his mind they are to live, they are apt to do that. Now if he possess strong convictions as to the influence of the "moon's sign," and it do not cost too much time to have the "sign right," and the result is to convert the shepherd from the mental attitude of foreboding to that of hopefulness, it is manifestly worth while to have the sign right. And I have no doubt that the moon exercised a distinct influence (in this sense) on the castration of many a flock.

DOCKING.

Docking is done at the same time as castration. It may be done with a mallet and chisel, but if the operator will take the trouble to push back the skin before making the cut, the knife is preferable. Catch the tail in the left hand, push toward the body of the lamb, feeling at the same time for the joint. Now draw the knife quickly across the joint, and the work is done. The skin thus cut long covers the end of the tail and heals up sooner. The knife often misses the joint, but no matter, so that the tail comes off at about the place desired. It is not worth while to make a second cut for the sake of getting off the piece of bone, for it will soon slough off, and the little fellow has been used badly enough by this time without having a second cut taken at his tail. The lamb may bleed freely from this operation also, and the bleeding may be stopped by searing the two veins on each side of the bone with a red-hot iron (if at a white heat it would cause less pain). I have used these very seldom, and have never seen a lamb die from bleeding at the tail alone.

MARKING.

Marking is only done to distinguish bands of sheep running on large ranges, or where it is desired to keep a record of each sheep, as in breeding thoroughbreds. Ear marking may be done either with the knife or

with regular marking punch sold at the hardware shops. Among breeders of fine sheep, there is a system of notches cut in the ear at the time of castrating and docking, by which each sheep has a number marked on him for life. Others use a metallic strip, with the number and owner's initials stamped on it; this is fastened on by punching a hole in the ear, and inserting the strip, which is then flattened down like a rivet, eyelet, or clinched nail. And, finally, the number, or letters, may be stamped on the sheep with large wooden type, dipped in any pigment.

With this ends the special work of the lambing season, which—as meeting the average case of breeders in the central portion of California—I have supposed to commence in the month of January, and so have selected, in pursuance of the plan upon which this series of papers has been prepared, as January sheep work.

Enough has been said to show that sheep are not to be expected to "run themselves," or to show a satisfactory outturn when merely turned out—however good the range. On whatever scale sheep breeding be attempted, let it be gone into and attended to as a matter of business. The owner must expect to give his sheep a share of his own time and his own work. If this be done, he may look for a large return on the capital. The money investment required for sheep is not large; its rate of return depends mainly on the amount of brains that is invested with it.

HERDING.

"Herding" is the term applied to the work done by a shepherd in daily tending a band of sheep. Any able-bodied man is capable of serving as a herder; but the occupation is one requiring great patience, and, for this reason mainly, professional herders are generally found to be men who have passed the heyday of life, or else are gifted with that peculiar disposition that they can content themselves almost anywhere. I am told that the Chinese, after being duly taught, make unexceptionable herders. I have never tried them. The life of most shepherds on an extensive sheep ranch can be compared to no other unless it be that of a lighthouse keeper; for if he be a competent man, and his employer have confidence in him, they may not see each other for months. If the herder receives a visit at all, it may be only for a few hours, as the major-domo or owner of the ranch calls to see how his provisions hold out, to inspect and receive his report as to the condition of his band and range. Theoretically, a herder has his time to read, but practically, his whole stock in trade consists of a pair of blankets and a bundle of clothes; and, rain or shine, he is expected to be always with his sheep. For this employment, if he be a good hand, he may get thirty dollars a month. I have heretofore recommended assigning the best and most faithful shepherd to the lamb flock. It would be well if all could be found faithful, but this seldom happens, and on a large sheep ranch the owner must have his major-domo to superintend everything, and then he can himself superintend his major-domo. This man is to see that the shepherds are up to their duty, and also advise or give them such orders as from time to time become needful, as, if the range become eaten off, the sheep are to be moved to new pasture, etc.

THE OLD HERDER.

On the plains, it is practicable for an old hand to manage almost any

number of *grown* sheep—say two thousand or three thousand in a band. And it is remarkable, the ease with which he will do it. At times, one might imagine that he was not earning his wages, but watch him closely, and as much method and foresight will be detected as in the management of an old schoolmaster. If it be necessary to use any control over the movements of the sheep, you will see him walk to this side or that, and by a few words, wheel the band to right or left like an officer with a platoon of soldiers. Such a man is up betimes in the morning, has his breakfast cooked and eaten, his lunch tied up, has opened the corral gate, and is now waiting the pleasure of the sheep to move out. There is no hurrying nor driving. Each walks out at leisure. Should any light-headed one wish to crowd, there is ample time for all to get quiet again outside. Then old chums or friends look each other up, and finally all start off together for the day's feed—our old herder accompanying at some distance off, apparently as a mere matter of form. If everything goes to suit him, and he be an old sailor or Mexican, he may now pull out an unfinished riding whip, or pair of bridle reins, and fall to plaiting them; or probably he sits down to the congenial pastime of sewing on buttons or mending his well-worn coat, but always with his "weather eye" on his flock. Thus he goes through the forenoon. At midday he takes his lunch. If he be fortunate enough to be at some creek or water, well and good; if not, he has known beforehand, and brought his canteen along. Later in the day he may be seen standing listlessly, or dreamily leaning on his staff—apparently wishing for sundown. But this suggestion does the old man injustice; he is now busily engaged on his flock. Another day has passed; they are soon to go into the corral, and he is taking count of them. Probably he is counting the black ones, or the bell sheep, or some other noted ones he remembers. This is his way of "calling the roll." If it be late in the season and the bucks are through serving the ewes, he includes them in his count, for at this time they are very prone to going in bunches and lagging behind. Any little coterie of ewes and their lambs who are in the habit of parting off or straying away, will be looked for; and although all the band may apparently resemble each other, like so many Chinese, still the herder will have marked the leader of all such little coteries by some individual peculiarity, and will not be satisfied that his flock is intact until he has seen her. Should he not see her at that time, and he has used the same corral say a week, he knows precisely where to look for her in the morning; for she, and each sheep in the flock, has a favorite place in the corral where to sleep, and, unless disturbed, will always be found within a few feet of the same spot every morning.

No matter how smooth or level a plain the sheep may be herded on, they will soon have it divided off into regular sections or ranges, and you may almost see it in their eye at which place they are going to stop. They appear to take much enjoyment in this way. In the morning when they come out of the corral gate they will all start off for one of these sections; by noon they will have worked their way to a second one, where they may rest; after which they will turn toward camp, taking in some other favorite spots; and so on, from day to day.

SHIRKS.

This account of the method in which an experienced and faithful herder works his sheep may be taken for a set of "sailing directions," as to the way in which a herder ought to work his sheep. Occasionally

the major-domo will find a perfectly competent man who, however, is a confirmed "shirk." However proficient he may be, this man ought to be got rid of the first chance he can be spared; he is a costly hand at any price. Such an one, too, knows two many tricks to cover his laziness. At times a lamb may, from castration, or other causes, become paralyzed, so that he may have to be carried home at night. He will often make a good sheep after all; but one of these shirks will knock him on the head, or get rid of him in some way. I have had them mysteriously disappear, and afterwards found the carcass in the hollow of an old tree, or other hiding hole. Or an old shirk can, by a little judicious training in warm weather, have the sheep stay in the shade four fifths of the time and (as it is termed) "shade them poor." When grass is good it does not take a sheep long to fill itself, and it will then lie down, even without a shade.

SHADE—CONTENT.

This has led some to contend that shade is of no real use to sheep; but this is a mistake. Any close observer will see that sheep gauge the distance to shade, and on a hot day feed toward it as regularly as they do to the watering place. There is no doubt in my mind that they are more contented thus, and all experience and observation goes to show that one of the most important items contributing to the well-being of sheep is content—the absence of fretting or worrying in all its forms. Sometimes there may be a wether flock which it is desired to fatten, and to accomplish this some managers will move this flock from time to time so as to keep it always on flush food, moving the bands of ewes on the ranges as the wethers are moved off. It is to be remarked that this is not always a good plan. Like other animals, but in a special way, sheep form an attachment for a range that they may run on, and exhibit a contentment there that they do not feel in a new locality. When, therefore, the wild grasses only be relied on, it will often be found that a sufficiency of short grass, with contented minds, will fatten sheep better than a new range on which no stock may have run since the rains. During the drought year I knew many cases where sheep did much better on their own range than those that were moved to newer ones. It was often remarked at that time that those who secured new ranges often fared worse than those who, from inability to find or rent other places, were compelled to stay at home.

HERDING IN THE HILLS.

Herding in the hills or mountain country is much like that of the plains. The sheep have to be kept in smaller bands, but they have the same habits in feeding and want the same sort of judicious "letting alone" on the part of the herder. They will start up some particular gorge, feed for awhile, lie down for their noon *siesta* if grass be good, then strike out over the hills, working back toward camp at night. They "ask no odds" nor wish any instructions, nor need any so long as they "come home with their little tails behind them."

ACORNS—SALT.

In a timbered country during the Autumn, sheep may be quite troublesome in acorn time; for if the trees be far apart or acorns scarce, the

herder will almost need a saddle horse to be master of the situation. For the sheep will neglect the dry grass of this season to devote most of their time to hunting acorns. Some shepherds think acorns injurious, and attribute all sorts of sheep ailments to them, such as stillborn lambs, or malformed ones, or monstrosities. I have had ample experience of this feed to be in position to form an opinion, and have yet found no injurious effects from sheep feeding as freely as they please on acorns—it being understood, of course, that each corral or camping place is at all times supplied with salt within reach of the sheep. This provision will never be neglected on any properly managed sheep camp. So far from acorns being injurious, I have found them excellent feed—provided only that they come in such quantity that the sheep need not run too much in the effort to find them. Constant running and little feed will soon pull down any sort of stock.

WINTER.

As Winter approaches, the herder must look for harder times. The days are shorter as well as the grass; on too many ranches, no provision whatever is made for the sheep at this season; and they are kept busy from daylight to dark, picking up the amount of feed they require. On many ranges, this feed is now of a very innutritious sort. During storms of rain and wind, sheep feed but poorly anyhow. On the plains, they often turn their backs to the storm and drift with it, and have to be urged quite strongly to face it when it becomes necessary to go to camp. In the hills at this season, latitude being equal, they fare better; for there a friendly hillside may be found, comparatively sheltered from the wind, and here they will feed.

STRAW STACK.

On the plains at this time a good long straw stack answers every purpose, serving at once as a windbreak and furnishing food much superior to the water-soaked grasses which have been deprived of almost all nutritious substance by successive leachings. Mercy to dumb animals (to say nothing of self-interest) calls for shelter and plenty of feed at this season; but, in most places in California, a sufficient stack of straw is all that is required during the month or six weeks between old and new grass. Other shelter is also good, but sheep sometimes prefer to be out in a good warm rain. I have often found, when keeping a small flock at the barn, that they would all be lying down outside during such a rain, though the barn doors were open.

SHELTER.

In breeding fine merino sheep, taking good care of them, letting the wool grow a full year, housing during long-continued storms is, undoubtedly, required; for though the wool is close, and a rain of moderate duration works no harm, yet after several days' rain the fleece becomes perfectly saturated. On examination, in this condition, it will be found that the fleece will open in a few places only, and will not admit of the water being shaken out, as can be done with the open wool breeds. The weight of such a fleece soaked full of water is something enormous. The sheep will actually travel with difficulty under the load. During terms of housing, the main flock need no feed beyond

straw, with, perhaps, an occasional feed of hay. Late lambs, old ewes, and any that may be thin in flesh, may have hay, and some oats. This is as far as I have ever gone in the way of supplying feed to an ewe flock during housing.

CROSSING WATER.

I have laid much stress on the necessity for not running the sheep, or handling them roughly. At this season of the year there will be occasions when the tamest sheep try one's patience sorely. It may be needful to make them cross water—a position in which they act very stupidly. There are several ways of proceeding. If very tame they can often be enticed across by the offer of a bunch of hay or salt. Catching two or three, and tying them on the opposite side of the water will often induce the rest of the flock to yield to your urging. Especially is this plan likely to be useful if an ewe and lamb be thus separated. It is only needful to get the first few started, and the rest will follow. I have seen two thousand sheep cross in single file on a plank a foot wide.

REDUCING THE REFRACTORY.

In hilly country sheep will sometimes get lost in small bands. Should there be only four or five in the party they may become very wild and headstrong. They may even act this way when parted out from some neighbor's band, with which they may have been ranging. Should they prove unmanageable, refusing to travel, or running off from you, the adroit shepherd will practice against them a "string game" quite as effective as that the card sharp plays on the over-confident rustic. Catch the leader, or the whole party of the rebels, and tie around one of the hind legs just above the hock joint, a piece of stout string—not too tight, but so that it will not slip off. This causes the sheep no inconvenience while walking, but it will not run an hundred yards with this simple bracelet. I have never seen any injurious effect from its use. After an exacerbating struggle of several hours with a band of these wildings, when one's better nature has been wrought into deep eclipse, and vengeful and slaughterous sentiments hold sway, I know nothing that brings upon the soul so deep a peace, or causes the moral sunshine to burst forth more ardently, than the view of those fractious sheep now pacing quietly along with wrath in their hearts, but spirits hopelessly broken. Occasionally one will have a single ewe in a band that ought not to be too large for one man's management anywhere, who will make more work than all the rest. She needs the simple lesson of the string.

WATER.

In the Spring of the year, when grass is quite young and green, and the night dews heavy, sheep will drink but little water, and in fields where they are confined on this kind of feed I have known them to do quite well for several weeks after all surface water had been dried up. This fact has led some to suppose that water is a secondary affair on a sheep range; but watch a flock on the hot plains, or in the baking mountain valleys, during Summer, and observe how systematically they work to water, and the obvious effects of a square drink on the spirits and condition of a flock, and, I think, the observer will conclude that

sheep do need water, and plenty of it. I would have water in the corral as well as on the range, when procurable by reasonable outlay; and if it be running water so much the better. By means of the redwood piping now made water can be brought at very reasonable expense. I have been traveling with sheep toward the close of a hot day, when both animals and men have been nearly fagged out. On a sudden every sheep in the flock would raise its head, and start in a brisk trot (as if running for salt), and go to a pool, or stream of water, half a mile distant, that I know they never saw before. So acute a sense is not commonly, I think, observed in animals to whom it is of no special use. In short, the notion that sheep can be stinted in water without disadvantage is inconsistent with all observation of the habits and instincts of the animal.

BELLS.

The advantages of having bells among the sheep are these: they help the farmer to find his band, should they be in the brush, or during foggy weather; they apprise the shepherd when the sheep are running or scared at night. Some claim that bells tend to scare off dogs and wild animals. It is better to put the bells on such individuals as are observed to be leaders among the sheep.

OUR WILD GRASSES.

On most sheep ranges in California one sheep to the acre of average feed will be found sufficient; or, if cattle or horses have been kept on a range, it may be safely stocked with five head of merino sheep for each head of neat stock previously kept. But this ratio I should say is as large as can generally be safely undertaken, on unfenced range, for a sheep raiser is expected to keep his stock on his own range, whereas cattle and horses are commonly allowed to go where they please. I have only tried alfalfa in a limited way, and without irrigation. I find it about the very best feed, and although I have no figures to offer as to the number of sheep it is possible to maintain on this clover, I am prepared to believe almost any of the big reports given of it by those who have made it a specialty. Of the wild grasses, alfilerilla, or bur clover, will undoubtedly keep the largest number of sheep to the acre. These grasses cause a marked reduction in the price of the wool, owing to the seed with which they fill it, and from which it is difficult, as the manufacturers claim, to free it. Still, when the amount of this reduction is weighed against the increase in the number of sheep which these grasses will maintain, the alfilerilla and bur clover ranges cannot be hastily condemned. Their seed pods or burs are most relished by the sheep after the rains have set in, and at the particular time when the grasses on the ranges of Central and Northern California have had their nutriment leached out, and are at their poorest as feed. On these alfilerilla and bur ranges at times it is surprising to see how the sheep live at all. Examine the ground of an alfilerilla range at a time when it is so bare that there appears to be actually nothing at all on it. This grass retains all its nutritious qualities, no matter how long it may lie in the sun to scorch and bleach. It does actually dry up and blow away. But it is caught, much of it in the shape of dust, in the swales, sheep trails, or cattle tracks, and on this the sheep will live and live well.

GRAIN STUBBLE.

Sheep turned on stubble must be watched closely at first, if the stubble have much grain on it; they may thus get too much grain, sicken and die. I am not aware that they founder—like horses. Where sheep get at grain accidentally, whether on a stubble field or otherwise, and are supposed to have gorged themselves, they must be shut up at once, and not allowed to drink any water for one or two days. Some shepherds allege as an objection to sheep feeding on stubble at all, that after this strong feed they fare all the worse when compelled to return to the wild grasses. I reject this notion, and find it best to feed *anything* that don't cost too much, so as to have the flock in good condition to go into the Winter with—and among the best means of obtaining this is feeding, with proper care, on stubble.

SOME CONCLUSIONS.

With sheep in poor condition in the Autumn, it is all uphill work till new grass comes. The sheep scatter about over the range and keep the herder traveling continually. Sheep cannot even be driven without sufficient feed. In driving on the road, even with a band of fat wethers, unless they be allowed to feed in the morning before taking up the day's march, it will be needful to kick them along; but if allowed to feed well in the morning, they will afterwards raise their heads and walk off and travel as far as any other stock being driven to the butcher. With the flock fat and in good condition in the Fall of the year, the sheep man can take the chances very safely of getting through the Winter as well as the horse man, cow man, hog man, or "any other man."

There is a saying in the army to the effect that, "to be brave, a soldier must have a feeling of *distension*." It is applicable to the working of sheep in its every phase. To herd well, to drive well, to lamb well, to shear well, to thrive well in every wise, sheep must be able to experience the sense of abdominal distension. And the poorest of poor policies in sheep management is to so overstock a range that the sheep, from lambhood on, can but rarely know this eminently comfortable and comforting feeling.

[In a previous portion of this paper, on the subject of lambing and management of the ewe and lamb flocks, I might have stated in terms of percentage of increase, the measure of success that ought to be looked for. Unless the conditions of season, feed, etc., be extremely adverse, the flockmaster ought not to be satisfied with less than eighty-five or ninety per cent of lambs raised. With an ordinary season and fair feed he ought to be able to count upon one hundred per cent, and perhaps something over. The season just past has been an exceptionally favorable one, and an unusually large percentage of increase has been generally secured throughout the State. The increase in my own flock is not far from one hundred and fifty per cent, and I never had better lambs nor the flock in better condition; but it is proper to add that I never before secured quite so large a percentage of increase. But, with the management during the lambing season that I have already described, and on range that is never overstocked, an increase of over one hundred per cent can be secured four years out of five. Remembering the axiom which, I have said, lies at the foundation of success in

sheep raising—that increase of lambs is increase of wool, mutton, and money—the significance of these high percentages will be appreciated, especially in contrast with the ratios so often heard of, fifty, sixty, and seventy per cent.]

SHORT OR LONG STAPLE.

Shearing in most parts of California is performed twice a year. Some contend that the sheep do better when thus shorn, and that if left unshorn in the Fall, they will shed their wool before Spring. Further, if shorn but once a year, a weak place may be found in the staple at that part of the growth that was made during the Fall. In consequence of this semi-annual shearing, the bulk of California wools are so short in staple that a serious discrimination in price is made against them, and of late there has been a good deal of talk about cross-breeding in order to lengthen the staple, and some experiments in that direction are now in progress. Before discussing the question I will ask to state a fact or two that will be accepted by some readers as possessing significance in what I may have to say. As to my own clip no buyer offers the objection that the staple is either short or weak, and for the reason that it is neither. It realizes a price within one cent or less per pound of the highest price that is paid for any wool at the time it is sold. My sheep do not shed their wool before Spring (they are shorn but once a year), and as to their "doing well," I have yet to learn of any flock in California that does better. It has good range, however—hill range—the year round. Nevertheless, the reasons alleged for semi-annual shearing—that the wool may be shed before Spring, and that a weak spot may be found in the Fall growth of the staple—have a real existence. I have formerly experienced the same difficulties, and found them to be caused solely by insufficiency (whether in quantity or quality) of the Fall feed. Both are avoided by reducing the amount of stock on the range to a point that insures them ample and good feed the year round; and the practical question is thus reduced to a choice between two alternatives—either on the one hand, the larger flock shorn semi-annually, producing a short stapled, low-priced clip, the flock in lower average condition and yielding therefore a lower annual percentage of increase; or, on the other hand, the smaller flock shorn annually, producing a long-stapled, high-priced clip, the flock in higher average condition and yielding therefore a higher annual percentage of increase. Upon these alternative propositions, each sheep raiser will make his own figures of experiments and be guided accordingly. My experience of both methods has resulted in the adoption of the latter, and I have no doubt that, in the average case, similar experiments would lead to the same result. The case is not unlike that of fruit growing. The younger grower finds it hard to prune away four fifths of his new wood and pull off four fifths of the young fruit. The longer he is in the business the more resolutely he prunes and the more relentlessly he sacrifices quantity of fruit to quality. So in sheep raising: where the grower has secured a fine increase in lambs, it is hard for him to cull out ewes both old and young for the butcher along with the wethers, so as to keep his band down to a point where his range can carry them in high condition the year round; but I think that the longer he stays in the business the more critically will experience teach him to cull, and the more to go in for quality—rigorously sacrificing quantity after the proper limit of his range has been reached.

If old sheep have been shorn in the Spring they cannot be shorn till late in the Fall if you are to have a salable length of staple, which sends them into the Winter with a short coat. Some growers compromise the question of annual or semi-annual shearing, by shearing three times every two years, by which they contrive to have an eight-months' fleece at a shearing; thus they shear one year quite early in the Spring, then again late in the Fall, then again late in the Spring (or in the Summer) of the following year. On this plan the sheep go into the Winter with a good warm jacket at least every alternate year; the odd year they go in with a very thin and poor one. Whenever sheep, at whatever season, become "dead poor" the wool becomes "fleece grown," as it is termed, and produces the weak spot in the fiber which makes a reduction in the selling price. Scab, where it is allowed to make much progress, may be a cause of shedding wool, but there is no sufficient reason for its being allowed to make such progress, and the sheep raiser ought to look upon it as a disgrace to his flock, and to his own management, if it do so. But of scab and of crossing breeds to procure length of staple, I shall talk hereafter. These general considerations bearing on the question of annual, semi annual, and eight-months shearing, having been digested, brings us to the detail of when and how to shear.

WHEN TO SHEAR.

As I said at lambing time, the diversity of climate in California is so considerable, that no fixed date can be given at which to do anything with sheep; but the Spring shearing can, generally, be begun about the second "warm spell" of that season; this will have given the oil and yolk sufficient chance to permeate the whole fleece, giving the wool a lustrous appearance that it lacks if taken off after a thorough washing or drenching by late rains. Moreover, the wool shears better in this condition and acquires something in weight. The manufacturer, after having scoured his wool, adds oil to make it work up well. The beginner will not be apt to go far astray as to time of shearing if he follow the example of his experienced neighbor, for he will hardly locate himself anywhere where sheep can be raised to advantage that there are not some sheep already. But he may by this "taking items" be led to shear too early, as for instance, if he should follow the example of some breeder of fine bucks who may be practicing what is called

"STUBBLE SHEARING."

This is a reprehensible "trick of the trade," and consists in shearing just late enough in the Winter to call it "Spring," and then half shearing by taking off only the outer ends of the wool, leaving on a moderately good fleece, particularly over those portions of the animal where it may be naturally deficient. This kind of shearing is done in order that the purchaser of bucks may be told that they "were shorn this Spring." Happily, this trick requires a very expert hand with the shears; and, in fact, few of the ordinary shearers can perform it decently. Most, if not all, breeders of fine sheep, shear first the rams that are to be for sale, and sometimes do so quite early in the Spring. No wrong is done if they be then shorn close and the purchaser told the truth when he asks the age of the fleece; for it is done in order that the ram may look at his best when he is sold—a proper thing for the seller to do, and not without utility to the buyer, who judges the sheep, know-

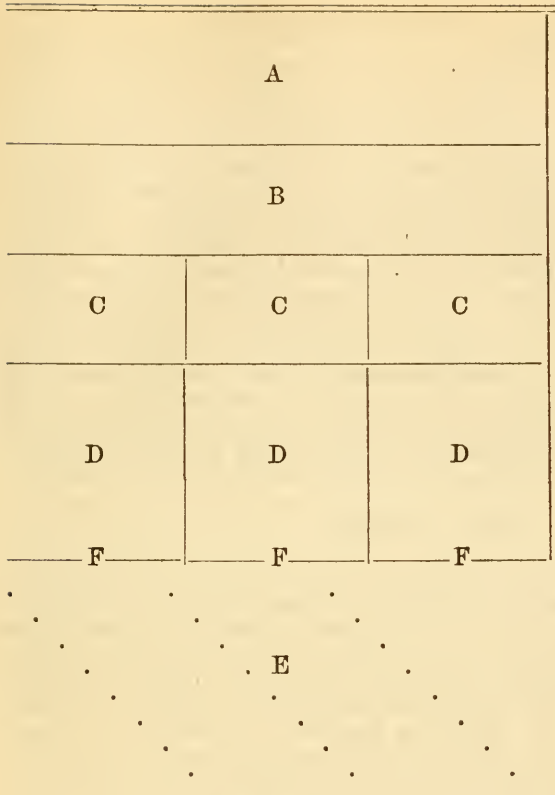
ing him to be at his very best. A poor appearance indeed would some northern sheep present, if shorn late, in the eyes of a southern buyer who comes up to select rams and take them home and use them in time to have the lambs come the following December or January.

SHEARING, CLEANLINESS, ETC.

Shearing is best done on a clean barn floor, and all large sheep ranches are provided with shearing barns at the home place. If a proper barn cannot be had, most shearing corrals, by dampening down and special attention to cleanliness, can be made to do in a rough way. It is true that buyers have not apparently discriminated against merely dirty wool as much as some growers would expect. The reason is, that this kind of dirt does not make a large part of the total weight lost in scouring; and certain seeds may be more troublesome to the manufacturer than mere dirt; thus he has come to give more consideration to these other elements of condition, along with those that go to make up quality, in making his price, than to the mere presence of a greater or less quantity of dirt. But although clean and well packed lots of wool have been the exception in California, it is the truth that this condition does help the sale. Especially if wools be at all slow in the market, the dirtier lots will be passed over by buyer after buyer, and the cleaner ones sold first. And further, a clip that habitually comes to hand in exceptionally good condition is practically sold as soon as it is shipped from the ranch, for previous buyers are always ready to take it on arrival at the top value of the market according to its quality. It is often a convenience to the grower to get ready and favorable "accommodation" from his commission merchant, and this is granted most readily and most favorably when it is known that the clip will "go off" promptly and at full value as soon as received. Besides being dirty, wool is sometimes fraudulently packed. Some growers have simply watered the fleeces to make a gain in weight; others have thrown in with them anything that may have been lying about the corral, whether wool, bags, dung, or lumps of adobe. The writer saw one bale of wool sold during the high prices of two years ago that contained one old boot and a worn out apple-paring machine. I have not yet heard of a gang plow or six-horse wagon being found in a wool sack, but nearly every other piece of farm refuse has at one time or another turned up amongst the California wool clip.

SHEARING PENS.

Having a clean floor on which to shear it may be divided off into pens by the movable panels heretofore described, in whatever way may be most handy, so as to have one place for the sheep to stand, another place for the shearer, and a third for the wool when shorn. A chute for parting, such as heretofore described, will also be rigged. The arrangement represented in the following diagram may suit some:



A, compartment for wool. B, table extending across the three shearing benches C C C. D D D, pens in which stand the sheep and shearer. E, lane in which to bring sheep up to the pen gates F F F, the dotted lines showing the gates so opened to drive in. G, an alley or large compartment or corral, into which the sheep for each half day's shearing are to be driven.

SOMETHING ABOUT SHEARERS.

I would not have more than two men in each pen, and it is preferable to have a separate pen for each shearer. This tends to prevent "racing," and if any hand wants to outshear his companions, compels him to do so on the "square," not nicking the sheep all over, nor shearing it badly, as he will thus be detected at once. When several hands are turning their shorn sheep loose into the same bunch, it is difficult, without losing too much time, to tell who the shirks are. Sometimes a violent tempered shearer may so injure a sheep that it will die; in fact, I have had them killed in my presence. Of course, I got a good round price for the loss, but that does not always repay it. Sometimes a young, thoughtless hand, or an old scamp, will throw his whole weight on the neck and shoulders of a restive sheep and crush it, so to speak, against the shearing bench, while it is in a sitting posture. Look out for any such work

as this, for it is the worst thing a shearer can be guilty of. It is easy to imagine the result with an ewe at Fall shearing, big with lamb. Even ewes not with lamb, and wethers, may die of the effects of injury thus received, long afterwards, when the shearer is paid off and gone, and you have no recourse. Again, if you have too many shearers in one corral, and any of them are slow hands or beginners, these are sure to have all the most wrinkly, dirty, scabby, and difficult sheep to shear; for the old shearer, like the old herder, knows his business, and when the fag end of each penfull of sheep comes, and say there is just one apiece to shear, he may hurry up and shear two to the slow man's one, or suddenly his shears will become dull, and he begins to whet; but, one way or another, he will work the thing about in such a way that you will find him having the first choice in each round of sheep shorn, and yet apparently doing his work right along. This is not fair as between hands, and the sufferers will try to get even, which will always be at your expense. The sheep ought to be caught and sheared just as they come; but as most men fail to perceive the justice of this when shearing in a crowd (and the undersigned may confess that in practice he has been one of them), it is best to have small pens, one for each shearer.

HOW TO SHEAR.

Sheep shearing and sheep breeding are such distinct professions, in California, that I will note for the beginner such points as, I think, he may and ought to insist on. As to where the shears are to be first inserted, and how the shearer is to hold his sheep, are points for the shearer to decide. I should insist that the fleece be always taken off as an entirety, with exception, perhaps, of the belly and tags. Also, see that the wool is not cut to pieces, or hacked by cutting twice in the same place. Each stroke with the shears should be clear and complete, and made close to the body. If a miscut be made, let it go at that; for if you do leave a half an inch of wool at that spot, you get it next shearing, and if cut now it will be too short to be of any use to the manufacturer, and will only injure, in his estimation, the parcel of wool in which it is discovered. In opening up the neck, or shearing the belly, when it becomes necessary to open the wool, let the shears be worked in gradually, cutting the wool on an even plane close to the skin until they are in and underneath the wool as far as they will go, then raise them, tearing the fleece open. Thus commence at the point of the shoulder, working up towards the head. This prevents cutting the staple along the neck, and makes a better job. In shearing on the floor a man has better control of his sheep. If shearing on a bench catch the sheep by the left hind-leg, back it towards the bench, and roll it over thereon; set it up on its butt, and then, as you stand with your left foot on the bench, lay the sheep's neck across your left knee, with his right side against your body; now, take the two fore-legs under your left arm, and begin about the center of the belly, and open the fleece fore and aft. Shear what would be the left side of the belly if the sheep were on his feet, also, the left side of the brisket. Now, cut off all tags from the inside of the hind-legs, and shear the breech as far as you can reach in this position. Return to the point of the shoulder, going up under the wool with the shears, as above described, to the butt of the ear; now, shear around, taking off the fleece as an entirety, and including the foretop, clear around the neck. You will proceed thus down the left side, taking the left fore-leg by the way, and always

shearing as far around the sheep as practicable, while holding it in the position described, which will be two to three inches past the spine. On reaching the hind-leg, say about the stifle, you will then insert the shears at the inside of the hocks (wool below that point is commonly tags), and shear around that leg back to where you left off on the stifle joint. Should the sheep persist in kicking at this stage, place the palm of your left hand on the stifle joint, which causes the leg to lie out straight. Shear clear around to the breech or the place shorn when working on the belly-faggings, and go clear around past the tail, so that, were the sheep standing on its feet, everything on its left side, including one to three inches on the right side from the spine, from head to tail, and including the whole tail, shall be shorn. Now, taking the hind-leg (the one that is shorn), in your left hand, swing the sheep around with its spine directly towards you, being careful that some of the fleece goes under him, for his left hip-bone, which is shorn and bare, now comes in contact with the boards, causing him to lie uneasily. Now, return with the shears to the head or neck, and go down the right side (the "winning side" as it is called), taking in the two legs, and the right hand side of the brisket and belly. You may now finish up, trimming off any tags that may have escaped, including that wool on the legs below the knee and hock joints. Now, see that the fleece is all clear from the sheep, and let the animal go. Next gather up all bits of fleece and tags, together with the fleece itself, and give them to the man who ties up wool. If the floor and bench round about be clean, proceed to catch another sheep; if they be not clean, and any excrement have passed, it is to be taken up and thrown out of the pen. It will be seen, by this description, that the wool, all through the operation, will hang down, and have a tendency to fall apart. This is counteracted, in a greater measure, if the sheep be shorn on the floor, than on a bench, for though the same manner of opening up and shearing is pursued, still, as the shearer goes down each side, the sheep lies on the opposite side, and the distance from that point of the fleece whence the wool is hanging, to that point on the floor where it is resting, is not so great as where the sheep sits "up on end."

THE SHORN SHEEP AND WOOL.

All sheep that are cut in shearing are to be attended to at once. Mere nicking does not much matter, but they may receive ugly wounds that require immediate attention. I use simple salt and water; some use the mixtures they have on hand for scab, rubbing it into the cuts—such as corrosive sublimate, coal oil, bluestone, or any of the patent sheep washes. I have not found them good on fresh cuts, particularly the first three, though they do quite well on old sores. If the cut is a very bad one, and the skin hangs down, it should be cut off at once or stitched back into place; if this be not done, the new skin will form over the wound, leaving the old skin hanging like a great wart, or what is known as the dewlap mark in cattle, and is sure to be cut off at next shearing, making almost as bad a wound as at first.

At A, in the above diagram, stands the person who ties up the wool. Many growers, with common sheep, think this arrangement too refined, etc.; but it pays if you have the right man there, for it is he who ought to superintend the whole gang of shearers. When shearing by the

head, the common plan is for each hand to take part of a hank of twine, in which the number of pieces is known; then, as each shears his sheep, he rapidly rolls up the fleece, ties it, and throws it into the pen for wool. At the close of the day he counts the remaining strings, and says he has shorn so many sheep. This is a bad method. Human nature is frail, and sometimes a shearer gets two strings into one fleece; again, he forgets his tally, and guesses enough to make himself safe; too often, I lament to relate, he lies outright. Now, although you know the total number shorn, it becomes disagreeable to adjust the matter if the guilty one holds out; and, if you refuse to pay, as you have a right to do, for the shearing of more sheep than you actually own, the innocent hand may suffer. But with a hand to tie up the wool, who is provided with tickets, or marked checks, no mistakes need occur, for each man, as he delivers his wool on the table, is given one of the checks, and on returning them at night is credited with his proper number.

Besides keeping the shearing account, this man can, by properly tying up the wool, render it much more attractive to the purchaser. Upon receiving the fleece, he will turn it with the flesh side down, pick off all foul stuff, straw, etc., and roll it up. In doing this it will be borne in mind that the best wool, all things considered, is on and about the shoulders. Roll in all the ragged corners. Place the wool from the belly and all *clean* tags in the center. Now continue rolling toward the center, or what is the same thing, doubling in, until the fleece attains an oblong form about as wide as you desire the rolled fleece to be. Now begin at the tail end and roll it up, at the same time doubling back enough from the head end so that when the roll is closed the fleece shall be "all shoulders." Roll moderately tight, taking care, if you have high grade merinos, not to roll too tight, so that the fleece looks and feels like a bullet. Tie the fleece sufficiently to keep it in place as rolled, but not too tight, taking care that it shall always have that indescribable look termed "lofty."

POINTS.

See that all tags, no matter how dirty, are picked up and put by themselves by each shearer after he finishes shearing his sheep, and before he catches another; if this be not done, they are soon knocked about and lost.

Each morning only so many sheep as are needed up to noon should be parted out with the chute for the shearers. At noon do the same for the afternoon's work. Never have a large lot left on hand at night, for if you continue to do so throughout shearing, which your shearers will assure you is the best way, you will find that towards the end all the hardest shearing sheep, and any scabby ones, will be on hand, as the men will have shunned them as long as they could. This way, a sheep that is free to go through the chute may be parted out day after day, and kept without much feed all through shearing. Besides, by parting out the required number twice a day, the balance of the flock gets more time to feed, and a full sheep is much the easier to shear.

The breeder of fine sheep will always be on hand at shearing, or have some one on whom he can depend, to take items of the sheep's shearing and note such as are worth preserving, in a register kept for this purpose. The fleeces may be marked for after inspection, but this is apt to be gone over too rapidly, so it is best for the owner to be present. This is perhaps the only occasion during the year that presents a perfect chance to form an opinion of the sheep's most important qualifications.

The owner is not compelled to take any one's opinion but his own. If he has any particular rams or ewes that he is disposed to think "can't be beat," he has now a chance to make notes that will serve for comparison. This is the time of all others for him to do his culling out. Each animal that goes below his standard may now have a distinguishing mark put on it, by which it can be picked out at a moment's notice when a purchaser comes along. If keeping anything like a complete register of his flock, the owner will find in this inspection of animals and fleeces all the work he wants, and no time for doing any of the dirty work of shearing. There are so many things to be taken into consideration in registering or culling out sheep, that a man who understands himself pretty well will hardly have pronounced on one animal before "the boys" will have another shorn and ready for his inspection. For instance, suppose one of your old ewes under view, and she is still thrifty and fit to breed; you already know her qualifications to be first rate, but her fleece falls off, say two pounds from its previous weight; you may be able to account for this by some incident of her career during the year without disparagement of her real merit, and thus be saved from condemning a superior animal. Again, every breeder ought to have in his mind an ideal standard sheep, as to form and fleece, towards which he is breeding and selecting. At shearing he can best judge those sheep that are departing widest from the direction of his standard, and cull out some that may be really high class animals and will command a full price as such. At the same time he will now detect the points in which his ewes are most generally deficient according to his standard, which will determine the points to be mainly looked for and secured in the rams that he will select for service the ensuing year.

PACKING WOOL.

To pack wool requires a platform from which the wool sack is to be hung; also an iron hoop which is made for the purpose, a one quarter-inch round bar, its circumference equal to that of the sack. First cut out boards enough to form the top; then cut an equal number of square feet of boards and lay at a right angle upon the first, and tack all together. Now describe the inside circle just one inch less in diameter than the iron hoop, and the outside circle in diameter equal to that of the hoop. Cut out the inside circle through both thicknesses of boards, and the outside or larger circle through the top boards only. Now nail (or what is better, screw) the boards together firmly at all points, and cut the whole platform across along the line into two parts. Next, out of four-by-four scantling make a frame, letting the two side pieces extend one foot beyond the platform towards the cross-bar. On this frame nail the half of the platform firmly. Nail on the other end of the frame side pieces, the cross-bar cut to take the wedges. The other half of the platform remains loose and is merely laid upon the frame and secured in place by driving home the wedges. If you had a bank barn and shear on the upper floor, this frame and platform can be laid over a hole in the floor, the wool sack hanging down in the lower story. If not, it needs to be mounted on any appropriate staging, six and one half feet high; four four-by-four studs set on end and well braced on three sids, leaving one side open, will last for years. Have the wool sacks each with a handful of wool in the lower corners tied around the outside so as to form a button or ear to the sack. Mount the platform, and putting the hoop outside of the sack near the mouth, turn over the

hoop about eight inches of the sack like a selvage or hem. Set the hoop into the circle cut for it, and after the assistant, standing on the ground, has pulled down the selvage even all around, wedge up the piece. You may now tramp in the sack to any extent, it will not come down unless it tears. From two hundred to two hundred and fifty pounds of wool should be put into a sack. Double these weights of heavy wool can be put in, but ought not to be, for the same reason that fleeces ought not to be tied up like bullets; many a wool buyer would object, and would really believe, that the shrinkage would be greater on the same lot of wool packed four hundred pounds to the bale than when packed two hundred and fifty pounds to the bale. When the sack is filled, put a rail or scantling under the lower end and raise it while the man above knocks out the wedges and removes the piece. The mouth of the sack may now be sewed up, leaving two ears on this end also; after which, let it down, taking it out of the stage-frame through the side left open.

TOBACCO.

TOBACCO IN CALIFORNIA.*

THE PLANTING GANG—MANAGEMENT OF BEDS—COVERING AND UNCOVERING.

During the season of planting each hand may be expected to set, on an average, two thousand plants daily. Picked hands, after practice, may average three thousand plants each. A very expert one can set four thousand. Knowing the total number of plants to be set, and the period within which it is desired to complete the operation, the number of planting hands to be hired is first ascertained. According to the variety of tobacco planted, the number of plants to be set on each acre will be from six thousand (Connecticut) to twelve thousand (Havana.) Thus if the total number of plants to be set be three hundred thousand, and the time within which it is to be done twenty-five days, it will be necessary to set twelve thousand each day. To do this will require six planting hands. There will be required, for tending the beds and other concurrent operations, an equal number of hands more—or twelve in all. The distribution of these will become apparent as the detail of planting is developed in the description of that operation. A two-horse wagon and team, it will be seen, is also required.

THE BEDS DURING PLANTING.

Provide at least a dozen boxes to contain the plants after they are drawn from the beds, each twenty-four by eighteen inches, and six inches deep. The cracks between the boards forming the bottom should be slightly open. Each box will hold about one thousand well grown plants. The plants to be set out one forenoon should be drawn from the beds the previous afternoon, and a supply for one half day's planting thus kept on hand ahead. The beds from which plants are to be drawn should be copiously wet down from six to twelve hours in advance of drawing. The wetting is done in order that the roots may be drawn without breaking, and it must be done long enough in advance for the water to have drained away, so that muddy lumps or clods may not adhere to the roots. The degree of development which a plant ought

* For the commencement of this article, see page 273.

to have attained for transplanting has been intimated in speaking of the management of the beds. Some have described it by saying that the plant at its "crown," or the point of junction of root and stem, should show that it has begun to make woody fiber. I should rather attempt to describe it as I have already done, by saying that the stem at this point should have exchanged the cellular, watery semi-translucent appearance of its structure for an opaque solid one. About the same time the root will acquire a woody look. The plant will have four leaves, and is always fit to transplant before the development of six leaves. Where the plants come very thick (as they ought) in the bed, they will stretch up tall and spindling, and, on the whole, may be preferred of that sort as being better to handle in planting. The quantity of root attached will vary with the previous management of the beds. If the supply of water has been constant, the season warm, and the growth rapid, there will be very little root. If it has been necessary to urge the maturing of the plants by alternately withholding and supplying water, the roots will be long and sometimes come away in bunches or tassels. One sort is quite as good as another for planting, where this is done with reasonable care.

MANAGEMENT OF PLANTS.

The plants are to be drawn as already described for weeding, by a steady strain directed, if needful, first one way and then another. The roots ought to come away without breaking, and will, if the beds have been properly wetted in advance. The ground around the root ought not to be broken or disturbed. If a young plant be lifted along with the one meant to be drawn, set it back again. As each plant is drawn, clean off any earth that may adhere to the roots, by a fillip with the finger, and clean thoroughly. This will be tedious if the beds have been wetted too recently before drawing, and it was partly in order that this part of the operation may give least trouble, that we select a light, sandy land for the beds. And it is needful to clean the roots for this reason: if a bit of wet earth be left adhering to them, when it comes to be set it will be compacted, its excess of moisture being squeezed out, and forms a clod which effectually arrests circulation and kills the plant.

Place in the bottom of the plant-box half a gunny or grain sack, folded and well wetted, and lay the other half, also wet, over the top. Set the box with one end resting on one of the backboards so that it inclines away from the sun. As each plant is drawn with one hand it is placed in the other (the earth fillipped off the root), and so held that the root shall not be exposed to the sun. Each handful is placed in the box, taking care not to pack too tight, and replacing the cover. The hand, also, is not to be filled so full as to squeeze the plants. Should wind be blowing, the roots will dry rapidly, and they must not be held too long before placing in the box. As soon as each box is filled, moderately water it (on top of the covering bag) and convey to a shady place, or set the empty boxes on top of the filled ones. The roots must not be washed (to clean the dirt off), nor must enough water be given after the plants are in the box to wash them. To diminish the risk of this, cracks are left in the bottoms of the boxes sufficient to insure the surplus water draining off. The boxes should be watered (moderately) every twelve hours, and after being taken to the field, as each fresh box is used, a little water should be sprinkled over the cover before it is removed. Thus tended, plants may be safely set out two or three, or even four

days after being drawn from the beds; nor will a journey of one or two days' duration affect them to an amount worth speaking of. As each plant bed is gone over, its cover is to be promptly replaced and well wetted down again—the ground thoroughly settled back about the roots of the remaining plants.

I may mention here as well as anywhere, that as soon as planting is finished, the covers of the plant beds should all be stacked up and covered with boards. There will otherwise be a good deal of torn cover and not a few broken frames to repair the next season.

SETTING OUT.

Provide a sufficient number of prods or dibbles—best made from old wagon spokes, and easily shaped with a drawknife—each fifteen inches long and one and a half inches in diameter. Draw to a sharp point by a curved or rounding outline—if drawn straight it will wear away too fast. Round off the opposite end to accommodate itself to the palm of the hand. Construct also a drag to take off the tops of the ridges, as follows: into a piece of four-by-six stuff fit a pair of shafts at such an angle that when hitched up the bottom of the four-by-six piece shall be horizontal. Opposite to the shafts set a pair of handles like plow handles. When in working position they ought to stand at nearly the same angle as the shaft. If set much steeper, the labor of elevating or depressing the drag, to take more or less dirt, is increased. Each planting hand needs also a sort of apron bag to contain his plants, put on like that used by a carpenter for his nails when shingling; the plant bag should be only six or eight inches deep, and stand well out from the man's body, so as not to squeeze the plants. It is best made, perhaps, of a rice mat—folding it over and over outward, as one rolls up one's sleeve. A sufficient bag, however, may be made of gunny. When beginning planting, a glove or other protection to the palm of the hand, used for two or three days, will probably save some troublesome blisters.

These preparations being complete, convey the boxes of plants to the field and set them in the shade, or cover them up from the sun. Start the drag, taking off the tops of two ridges at once down to a good solid breadth of moisture—but no more than necessary. Each planter fills his apron with plants, roots downwards, and sprinkles lightly with water. He takes his position in the furrow with the ridge on which he is to plant before him extending away to his left hand; as he plants, therefore, he works along leftwards. He takes a plant in his left hand, adjusting its roots by giving them a fillip with his right—taking care to knock off any dirt that may be adhering (but of which there ought not to be any); at the same time he knocks away with his right foot an inch or so of soil quite across the ridge at the point he is about to set the plant, and pats it slightly so as to make it firm, but not compact it. Then with his dibble makes a hole in the exact center of the ridge, say three inches deep, well opened at the top by a circular movement of the dibble, so that he can see the roots when he puts them in and see what he is doing. The plant is to be held between the thumb and fingers of the hand exactly at the crown, the leaves being within the hand, and so that the backs of the four fingers may rest on the surface of the earth at the left edge of the hole, preventing that side from breaking up when the pressure of the dibble comes against it, while the thumb

protects the crown of the plant from being burried by the earth which the dibble will move up. The roots may thus be laid—each filament being free—against the left wall of the hole, and the planter can see that they are so. Then insert the dibble slantwise about three inches away from the hole, and so that its point will reach the bottom of the hole, and by a movement—at once lateral and slightly upward—bring the earth up firmly against the roots of the plant. Withdraw the dibble and insert it again some three inches off, and by a similar operation fill the hole from which it was withdrawn. Close this hole again in the same way—all this time keeping the left hand at the plant, and now, releasing the plant and raising the body, close the last hole—which ought to be nine or ten inches away from the plant—by a firm pressure of the right foot. As you let go the plant, give it a slight pull to try that the roots are firm. It is likely that at first, somewhat to the planter's surprise, he will find that they are not—and the plant must be set once again. But in setting a score of plants, a careful hand will get the trick. Then make a step to the left, coming into position to set the next plant, at the same time drawing the right foot sideways along the top of the ridge, removing the top earth, so that the spots cleared to set the plants in may not form a series of cups. In overseeing a gang, keep close up to them and test each man's plants by giving them a slight pull. They must be set firm or there will be serious loss. It is as easy as not to avoid this, depending on getting the hands started right. It is not worth while to try and plant fast at the start. Break in the hands to plant well, though they set only one hundred and fifty plants or less per hour. Be firm in insisting on having each point done to suit you; make a "drill" of it, as if teaching the manual of arms. Be patient. When the hands shall have got the trick all right, then make them work up to a rate of two hundred to two hundred and fifty plants per hour. Some will be faster than others; let those who finish out their rows first set plants on the rows of the slower hands, so that all may start about even on the return rows. The proper distances between the plants are, for the different varieties of tobacco, as follows: for Havana, fifteen inches; for Florida or Orinoco (Virginia), twenty inches; for Connecticut, thirty inches. This gives to each acre the following number of plants: of Havana, eleven thousand six hundred and sixteen plants; of Florida or Orinoco, eight thousand seven hundred and twelve plants; of Connecticut, five thousand eight hundred and eight plants.

The faults to be looked out for in planting are these:

First—Not cleaning off properly little clods of earth or bits of mud that may be adhering to the roots, left there by the carelessness of the plant bed men.

Second—Not making the first hole large enough; the roots are consequently liable to be doubled up, and this is nearly always fatal.

Third—Failing to plant straight along the center line of the ridge.

Fourth—Failing to set the plants at equal distances; especially tending to set too far apart by the slower hands.

Fifth—Failing to bring the earth firmly about the roots—tested by the plant coming away at a slight pull. This is frequently fatal.

Sixth—Failing to close up the lower part of the hole in which the plant was set. This comes from not inserting the dibble, when closing, at a sufficient slant, or not putting it in deep enough. This fault is not tested by pulling at the plant, for the roots may be firmly caught in the upper part of the hole while their lower ends are dangling, or are in earth so loose that the air will dry it out.

Seventh—Making the three prods with the dibble too near together, so that the pressure of the foot in closing the last one compacts the earth about the plant. This retards early growth. The plant is set wholly with the dibble.

Eighth—Setting the plants too deep, so as to bury the crown. This is a very persistent and vexatious fault, especially where the plants to be set have short roots, as they will have if they have come on quickly in the beds.

Ninth—Failing to clear the space on which the plant is to be set, quite across the ridge, and failing to drag down with the foot the crest or ridge between two successive plants. The effect of this is to have the plants set in a series of cups, from the edges of which earth rolls down on them—especially when we come to cultivate.

Tenth—Failing to pat the earth firm enough, in which the plants are set, when it is liable to dry out if there be much wind when the plants are uncovered. This is hardly likely to kill plants, but may retard growth until after the ground is settled by first cultivating and hoeing.

If these faults be avoided, the ground having been put in proper order, and in the absence of anything specially unpropitious in the season, the loss of plants at this first setting may not exceed one per cent. The hotter the weather the better for planting, but drying winds are not favorable.

COVERING.

Each plant as it is set is to be covered with a small handful of grass, which is dropped by men who follow the planters. If the grass be good, not too long, so as to twist up and tangle, nor yet too short—say from a foot to eighteen inches in length—one hand should cover for three planting; or two may cover for seven. But if weeds, wire grass, or other trash be relied on for this purpose, it may take one hand to cover for two; or even, if it be attempted to use long wire grass and clover, hand for hand. And commonly this stuff will have to be hauled some distance. Taking all things into account, it is a decided economy to sow grain for covering, and let it be done on land adjoining the tobacco. It should be sown thick—say one hundred and twenty pounds of wheat to the acre—then one acre of cover will provide for four acres of tobacco. By sowing early it is sure to be ready by the time it is wanted, while—should it become apparent that the cover is going to be too long by that time—it can be mown over once in advance. It is well to roll this cover land at the proper time to make the grain stool out more. A horse mower will cut in an hour a supply that will carry six hands planting through the day; but if the cover be over two feet high it will be economy to cut it with scythes and take two cuts at it. Wheat, barley, or oats makes equally good cover; probably wild oats stools out most and goes furthest, but it is not always convenient to get the seed. Alfalfa is first-rate provided it be cut short; when long it tangles and is a great nuisance. Grain cut thus early for cover will still head out, though short and light, and pay for itself for stock to work on in the Autumn after the tobacco is housed.

The cover being cut, a two-horse team will haul within three hours a day's supply for six planters. It is to be distributed along the road at the long sides of each block—that is, at the ends of the ridges—in convenient cocks. The men or boys who cover, take each as much grass as they can carry under the left arm, and twitch out small handfuls with the right hand, depositing exactly on top of the plants. The

tendency of these hands is to waste grass by scattering it all around the plant where it is not wanted, increasing the work of supplying it and retarding their own, for they have to run so much the oftener after a fresh armful, which is time lost. It may also increase the subsequent labor of uncovering.

The cost of setting the crop, including that of tending the beds during the operation of resetting, value of horse feed, use of horses and wagon, and all outgoes, may be taken at two dollars per thousand plants. It is practicable to work within this figure.

The plants are to be left covered until they have begun to root and grow. Consider a moment their position. The grass wilts down close atop of them. They are in moist ground mulched, so that the moisture will continue to raise, shaded from the sun, protected from the winds. It is as if they were on a lush river bottom covered with a dense forest growth. Their position is better even than this, for the sun's rays warm the earth about their roots, and the still atmosphere bathes their leaves. As it wilts, the cover gradually admits to the plant more light and air. The wonder is not—as at first it seems to the old planter—that they should live, as that a single one should die. Nor will it, of its own motion, where everything has been done right. But it has still two insect enemies to escape—the cut-worm and the bud-worm.

FIRST CULTIVATING AND THE COVERING.

The cover, which soon becomes a wisp of bleached hay, is a breeding place for insects—most of which, however, appear to be harmless ones. Still, it is as well for this reason to get rid of it as soon as it is no longer really needed. If convenient, let a shovel plow be run between the ridges within a week or ten days after setting the plants, and before they are uncovered. Mr. Joseph Duncan, of the Consolidated Tobacco Company's plantations, near Gilroy, in Santa Clara County, has devised a useful attachment to be used with the plow for this purpose. It consists of a pair of stout sheet iron wings applied to the sides of the beam just forward of the share, and reaching down to touch the ground when the plow is at work. They separate as they descend, being adjusted at such an angle that the earth raised by the plow can flow back freely under them; at the same time they arrest any clods that the plow may tend to throw off on either hand upon the young plants. The plow must be followed, anyhow, by a hand who will pick off any clods that may be thus rolled over on them; but the "wings" will be found to save both hire and plants. This first cultivating before uncovering is wanted if there have been no rain to settle the ridges, which will have become rather light and porous, and is wanted if there have been rain, to break up the crust that will have been thereby formed. This crust is a great check to growth, which it brings nearly to a standstill until it is broken up. When it has been formed, therefore, the hoes should be got at it as quick as possible, and if there be not a hand or two to spare at the time for this purpose, it should be well to hire them. The plow should be run as deep as the ground was cultivated, so that you can feel the hard subsoil with the point.

Perhaps the only practical rule for uncovering to offer the beginner is this: when the plants look as if they had started, uncover one hundred or so, and see how they stand it. If they be all right, go on to the rest; if they die, wait a few days longer; then uncover a few more, and again wait the result. The plants will, of course, wilt down during

the day, but, if they come up again during the night, they are doing well. The condition of the plants, under the cover, should be looked to. If bud or cut worms are found to be operating freely, the cover ought to come off as soon as practicable. We must not be too much afraid of frost. In the first place, it takes a pretty hard frost to cut down a tobacco plant; in the second place, when cut down, it is only set back—not killed. The worms, on the other hand, make a finish of it. But if it appear that neither of these worms is at work under the cover, then there is no hurry at all about lifting it. And, especially, the work of planting ought not to be interfered with for this purpose. Unless there be a crust to break up, planting may be finished before the hoes are set to work, but they should start as soon as ever the first planting is done. By this time, the plants that have died at the first planting can be known, and a portion of the hands can reset them. Be in no hurry to give up a plant for dead. A majority of even the hopeless looking cases will make a live of it and show new leaves—in time. After the plants have had proper chance to root—say ten days of warm weather, or a fortnight to three weeks of cold—those that appear dead may be pulled up and looked too. If a growth of white spicules, like white mold, be found on the roots, it shows that the plant was starting to grow. When the plant is really dead, the cause can also be detected nine times out of ten, and will be found to be one of the faults in planting previously enumerated, or the work of a bud or cut-worm. If the last (cut-worm) the plant will have been cut off at the crown. The earth may then be turned up around it with the finger for a distance of five or six inches, and about two inches deep, when the malefactor will commonly be found, and immolated. The bud-worm (which is very small) operates by eating his way down the center of the stalk, leaving it a hollow tube to the crown of the plant, where he cuts his way out. It should be learned as soon as practicable through what fault plants are being lost, in order that it may be corrected in the balance of the work. During this examination, test the condition of the earth about the plants that are growing by pressing it, and if it prove to be very loose and open—settling an inch or so under moderate pressure—the shovel plow ought to be got to work promptly.

Uncovering can be done very expeditiously. A man starts at the end of a row and picks up the covers with his right hand, clapping each handful (got from five or six plants) under his left arm, without raising the body or breaking his pace, which can be kept at a smart walk quite across the block. Care must be taken not to twitch up plants along with the covers. The armfuls of dry grass are thrown down in the roads at the ends of the rows. If the covering of one row make more than an armful, so that the man has to carry out and deposit his load before finishing his row, it shows that a needless quantity of grass has been used, and this present operation is much retarded. The covering may be now hauled away and stacked for stock (it is not worth much for feed), or to the barn for bedding; but it should be moved at once, or else burned, for it is an insect breeder.

GENERAL MANAGEMENT—HOEING.

I may mention here that the tobacco fields should be kept free from trash of all sorts. Weeds growing along fences, in swales or sloughs, along a willow or other brush brake, should be faithfully mowed down, and when dry, burned. All such stuff breeds insects, and the mischief

they may do will become quite apparent in the losses of plants and the condition of those that survive in the two or three rows adjacent to such stuff.

The shovel plow may now be kept running steadily until the plants become too large to admit its passage without breaking the leaves. This promotes the free rise of moisture.

The first hoeing should be given as soon as convenient. An advantage will be found in first striking the hoe horizontally at a depth of about two inches, both before and behind the plant. Draw the earth snugly up about the stalk to the stems of the first leaves. Should weeds come after this, the crop should be hoed again.

At this point there may be a rest of two to four weeks (the only one of the season) before the next operations—worming and suckering. More likely than not, however, about this time (which, for the average case, I take to be the latter part of May), the tobacco (or horn) worm will appear. This opportunity may be availed of to make the racks upon which the tobacco is to be hung during the process of curing, to be described in the succeeding section, entitled "Cutting and Curing."

CULTIVATING—WORMING.

The cultivator or shovel plow is to be kept running as long as the size of the plants will allow.

A sharp lookout is to be kept for the first appearance of the tobacco worm. In Central California it may not appear before the end of April or perhaps May. Further south it may be looked for earlier. The worm grows very rapidly, and from the time it is half grown its ravages are grievous. When plants have made a good growth—say a foot or fifteen inches in height at the time the worm appears—he will commonly complete his growth upon a single plant, of which one half or more of the leaves will have half their value destroyed by this creature; but should plants be backward and small, the worm may operate on two or three or even four before completing his work, devouring them almost entirely. His parting act, too, is his most mischievous: he takes his last meal off the tender stalk at top, which thenceforth grows no more. All considerations point to the importance of catching the worm at his first appearance, and this, as it happens, is as easy to do as to take him at a later stage.

The worm begins operating on the lower leaves of the plant, usually near the stalk. He begins cutting half-moons out of the edge of the leaf, to the concave edge of which he clings. At this time he may be less than a quarter of an inch in length, no thicker than a hair, white—but he carries a mark that the eye can quickly learn to catch: it is the characteristic "horn" situated on his back near the tail—at this stage a minute black hair—that can be seen sticking out from the edge of the half-moon, or sticking up from the under side of the leaf when it is turned up, when the body of the worm itself would not otherwise have been noticed. From this earliest stage to the end of his career the worm leaves his sign behind him, in the form of black excrement, which falls upon the leaf under that on which he is operating. This is called "sign." At first it is a black dust, and may be always distinguished from other dust, because it is black. As the worm grows he mounts the plant, operating on successive leaves, his course distinctly marked by the "sign" remaining on the leaves beneath, as well as by the ravages of their outlines. From the time the worm has attained a length

of half an inch he becomes a pale green in color, and commonly changes his position from the edge of the "scollop" that he is cutting, for one on the under side of the leaf, where he is apt to lay himself along a vein—of which he appears to be a part; he would now often be hard to find but for that tell tail. Growing larger, the worm becomes a darker green, with annular yellowish spots along his sides; he soon completes his full growth—a length of three and one half to four inches by a diameter of about three eighths of an inch, and then betakes himself to the ground, where he burrows six inches and more deep, spins a light cocoon, and later appears as the "horn-blower" moth—that great moth near the size of a humming bird, the sound of whose flight its own nearly resembles, that is often seen and heard after dusk during the Summer months.

These in their turn breed a second crop of tobacco worms, that may begin to appear by the time the first crop is fairly done with. This second crop is not apt to be nearly so plentiful as the first, nor are the ravages it commits really so injurious as those of the first; for the plants being now grown, can better afford the loss of leaves. But the planter can no better afford the loss of his tobacco; therefore the second crop of worms are to receive as faithful attention as the first; and for the further reason that they are to be the immediate progenitors of the next season's crop. They are much harder to find than the first crop. It is not easy now to see their sign amid the rank leafage, nor to distinguish their operations on leaves from those of the first crop. Special attention may be directed to the newer leaves of the plant—those that have grown since the epoch of the first worms; "sign" on these leaves is sure to be that of new worms, and they appear, too, to prefer these younger leaves, especially in the earlier stages of their own career.

To find sign of tobacco worms, walk very slowly between the rows of plants, scrutinizing the leaves of the plants as you approach them for "black" particles of any kind, and for scollops eaten out of their edges. It obstructs instead of assisting this operation, to stoop and examine the separate leaves of the plants; you can best detect "sign" in an upright position, taking a "bird's-eye" view of the whole plant. There are other insects than tobacco worms that eat holes in the leaves, and occasionally take a piece out of the edge; but these operations do not amount to much, and those of the worm are so characteristic that they are soon recognized at a glance. Besides, if there be another leaf beneath the spot that has been eaten, it will infallibly show "sign" if the mischief was done by the worm. Having detected his work on a plant, it is by no means to be passed till the worm is taken and killed, or it is absolutely certain that he is not there. Observe the plant a moment before moving a leaf. Observe the course of the worm upwards by the sign, increasing regularly in size, left on successive leaves. Having noted the topmost leaf on which this is to be seen, turn up the leaf immediately over it, and on its under side, four times out of five, there is the culprit. When sure he is not there, turn to the corresponding leaf on the opposite side of the stalk; he may have just changed his base; and if need be, go over every leaf on the plant a second or a third time, till it is put beyond a peradventure that the worm is not to be found. The worm will occasionally have been taken off by a bird; more often a shrunken, hollow, transparent shell may be found, identified by the black horn—the "wretched remains" that have been sucked dry by a spider. Or it may be obvious that the worm has operated to the top of the plant—giving his parting work to the tender stalk—and has either gone into the ground or on to another plant. If the former, he is not to be discov-

ered, but if the latter, he must be hunted down. The size of the "sign" on the plant he is supposed to have left will indicate which is the more probable. When satisfied that a worm is no longer on a plant, and it appears that his operations stopped before he was grown, and before he had worked upwards as far as the leaves were eligible, it is fair to infer that a bird or yellow jacket has got away with him. Sometimes two worms will be operating on one plant. This can be inferred from the sign, and equal pains must be taken to destroy both.

Instead of being a tedious and costly job, as this may seem, it is soon accomplished. When worms are tolerably plenty, one hand may be expected, after he has learned the ways of the creature, to worm *thoroughly* five thousand plants or more per day. Care is to be taken in this as well as in all other operations, not to break the stems nor the edges of the leaves. If the stem be broken, that part of the leaf beyond the fracture withers. For manufacturing purposes—especially in all the varieties of cigar tobacco—an unbroken edge is one important element in the value of the leaf. For these reasons, too, the use of turkeys and ducks to catch worms is costly as well as ineffective. They fail to find the very small ones, and injure leaves.

Several other insects take up their abode in the plant, but work little or no injury. One of these is a fly having a body shaped like that of the searabæus beetles. It is usually a pale green; occasionally one will be found of a light brown. Another insect is a small, roundish black beetle. This one is fond of collecting in numbers at one point—at first on the stem of a leaf; apparently they suck the rising sap, for that part of the leaf beyond them will look dull and blighted; if when it is in this condition the sun's rays fall hotly on it, it may scorch; but after the beetles have removed to another point of operation, the leaf (unless scorched) shortly recovers. After the blossoms appear, these beetles collect on the flower stalks. Another insect is a flea, which bites pin holes in the leaf. But all these amount to nothing. The real enemy of the plant is the horn-worm. It is said that grasshoppers, when coming in great numbers, have destroyed young plants. The moth made by the bud-worm has not, so far as yet reported, been identified. That made by the cut-worm is well known. The only effectual means of checking the increase of all these creatures is by deep plowing in the Autumn, turning the chrysalis to the Winter frosts. The numbers in which all insects appear, as well as the date of their appearance, varies with different seasons, and a long wet season, even though cold, appears to be most favorable to them.

SUCKERING.

As the plant develops, a sucker starts at the point of junction of each leaf with the stalk, commencing with the lower leaves. Up to this point, the planter might have proceeded, following successfully the methods pointed out in this series of papers in their details, almost without the exercise of his own judgment. From this point on, the degree of his success will be influenced by that with which he brings judgment to bear on the work. As a rule for suckering, it might be said, defer it until the flower stalks begin to sprout; by that time the lower suckers may be a foot or more long, while those at the topmost leaves will be sufficiently developed to be got hold of and broken out. If the plants are making a strong growth and the condition and character of the soil are such that that kind of growth can be expected to the

end of the season, the rule above enunciated may be adopted as a working one. But the rational plan is to take the end aimed at into view and keep it there. The end aimed at, is the production of the greatest amount of cured leaves, of good quality. In order that they may be of proper quality, they must, first, not be too thick; therefore, where a plant is growing rankly, the date early in the season, and all outlooks good, all the leaves it will produce and all the suckers too (for awhile) may be wanted to dispose advantageously of its exuberant assimilation of plant food and formation of plant material. If, on the other hand, the plant be growing indifferently, or the date late in the season, so that it may be supposed the whole powers of the plant will be required to mature the leaves, suckers ought to be kept down from the start. Or suppose the plant growing vigorously enough, yet there be reason to fear that moisture may fail it later—(as in some soils underlain by gravelly subsoil)—then its growth during the fore part of the season is about all that it will make at all; in this case, again, the whole strength of the plant ought to be thrown at that time into a proper number of leaves. Or if the planter find that his soil (from whatever peculiarity) is actually drying out at a depth of five or six inches below the surface, he is to govern himself accordingly, and see that he secures the best use out of the brief remaining period of growth. For when moisture is withdrawn, the leaves stop growing "all at once;" they begin to yellow, and the plant throws its remaining strength into the stalk—which then shoots up to form the seed pod, with leaflets two inches or three inches long on it.

Other considerations besides these above suggested will also present themselves to the mind of the planter as he brings the crop along, and direct his action. He may foresee that it will be expedient to send the hoes through again this month or next, and modify the work accordingly; which suggests the remark here, that no expense for which the well doing of the plants appears to call, is to be spared on a tobacco crop. The plants are to have all the labor that will do them any real good, and they will repay it again and again. In a general way, it is the extra labor that makes the extra growth, and it is the extra growth that makes the greatest profit. A poor crop costs nearly as much, at best, as a good one. To secure the best net results from tobacco, the question with the planter ought not to be, "Can this or that expense be spared without injury?" but, "Can this or that expense be bestowed with real benefit?" Whenever the last question be answered affirmatively, and the answer is acted up to, the result will pay "every time."

In suckering, the work is done with both hands, commencing at the top of the plant and working down, being particular to get every one and not to break leaves. This requires care, to avoid, especially in breaking out large suckers, which are apt to whip the leaf beneath and break its edge. This work can be done about three times as fast as a man thinks it can when he starts in.

The total cost of cultivating, worming, and suckering, including use of horses and tools, feed consumed, etc., may be calculated at one dollar per thousand plants. It will probably fall twenty per cent within this.

TOPPING AND CUTTING.

The last paper of this series on tobacco culture concluded the subjects

of cultivating the crop, of worming and suckering. The variety of latitude to which the papers are meant to be adapted, appears to render it expedient to proceed this month to the subjects of "topping and cutting"—although the only tobacco likely to be ripe for cutting, as early as the first of June, would be the Havana variety or Connecticut seed-leaf, when grown in the southern parts of California, and early planted.

The tobacco plant shoots up its stalk at top, sending out some four or five main suckers branchwise, to bear its blossoms and seed pods. About the point of branching and above, it forms a number of small leaves, which are under merchantable size, and, also, too far behind those of the rest of the plant in point of maturity, to be cured with them. At the time the plant is cut, therefore, all this top growth is to be broken off. This operation is called "topping." On all but rich virgin tobacco land, the growth of the plant is not sufficiently vigorous to form all this top-growth, and at the same time to properly mature its main leaves. Hence, on such inferior lands, it is needful to "top" the plant a certain period before cutting, and throw the whole of its strength into the main leaves. Not only this: it is found on the poorer lands further expedient to break off several of the lowest and less valuable leaves, next the ground—this is called "priming"—leaving only twelve to sixteen of the largest and best leaves to receive the remaining strength of the plant. But if these operations be performed on a plant that is growing vigorously, drawing its substance from a soil capable of supplying whatever amount of food the plant is able to assimilate, very different results naturally follow. Under these circumstances, the first effect of topping at a similar stage of development, is to start a rank growth of suckers, with which, thereafter, it is all but impossible to contend successfully. Besides this, an undesired quantity of material is formed within the substance of the main leaves; they become thick and velvety, with heavy woody stems, curing up strong and rank in flavor and of low value.

This has been the history of some tobaccos produced in the Western States. The culture of the plant was carried from the older States to rich virgin soils in the West, along with the methods of managing it that had come to be adopted, gradually, from necessity, as the old tobacco lands had become impoverished. The result was the production, under favoring circumstances, of a coarse low grade tobacco, such as above described. On its first appearance, manufacturers found difficulty in dealing in it at any price. It took its place at the bottom of the price list, where the same quality of tobacco still remains. But the price has improved relatively to other tobaccos, for its extensive production at the West created a local taste for its peculiar quality, and of late years that local market has become an extensive one. During the same time, the character of the Western tobacco, in general, has changed, and improved. Partly this is because the soils have been cropped to tobacco until they have reached the stage to which the old methods of topping and priming are adapted; and, partly, because many growers have learned to modify the traditional methods to a better accord with their special circumstances. Plants are allowed to mature a greater number of leaves, which are thereby produced of an improved quality.

The market value of tobacco increases very rapidly with the improvement in quality. Thus, taking the market grades of Ohio tobaccos, when the quotation per hundred pounds for inferior to good common is seven dollars and fifty cents to eight dollars, that for medium spangled and fine red will be twelve dollars to thirteen dollars, and for yellow,

twenty-five dollars. Or, taking the Kentucky grades, when common to good lugs are nine dollars and fifty cents to eleven dollars and fifty cents, good to fine leaf will be sixteen dollars to eighteen dollars; and selections, twenty dollars to twenty-five dollars, or even higher. The prices obtainable for really fancy tobaccos are themselves very fancy—ranging up to fifty cents per pound, and higher. The Virginia gradings are similar to the aforenamed; with common to good lugs at six dollars to eight dollars, good leaf will be twelve dollars, and shipping selections, say sixteen dollars; yellow, twenty-five dollars. The method of grading different tobaccos will be explained hereafter, but the practical mind will perceive in the light of these market quotations how largely the profits of tobacco culture may depend on the quality produced, and how rapidly they mount as quality improves. The price realized from the choice article is more than three times that of the inferior. It will be seen before we conclude, that in the California climate, the matter of quality is very much one of management of the plant before, at, and after cutting. The character of the season is liable to affect the result—occasionally in a material way. The question of quality is, to an important extent, one of management anywhere; but the greater variableness of the climate throughout the range of the tobacco plant east of the Rocky Mountains renders it there a far more potential factor in the problem of securing the choice qualities, than it is in California. Thus the California planter will find the greater encouragement in devoting his energies to the production of this crop, in the greater security that his efforts will not be defeated by the action of climatic and meteorologic agencies that are beyond his control.

As a first proposition, then, it is to be noted that in all the tobaccos except those used in cigar making, lightness of color, approximating a bright lemon yellow, controls the grade and price of all the better qualities. Second, that practice shows that these light colors cannot be produced from sappy leaves; and further, that thick leaves, produced by forcing too large a proportion of the growth of the plant into them, are sappy. In order that it may cure to a yellow color, the leaf must have begun to yellow—must show bronzed patches—while yet on the stalk before cutting. Before it can do this it must stop growing. Hence those varieties of tobacco in which these colors are desired, should not be preferred for low, alluvial soils, in which, during the hot California September, moisture to feed the growth of the plants will continue freely rising. For the cigar tobacco, on the other hand, deep, rich browns are the desired colors. Greater fineness of texture, too, is now required. In order to obtain this, the plant is to be cut often at an early stage of the process of maturing. At this time the leaves are necessarily sappy, and the brown colors that are sought for will come out unavoidably in the curing.

This general glance at the ends which are aimed at in the work yet to be done will contribute to render the description of it intelligible, and will, at the same time, suggest the proper adaptation of its methods to varying circumstances of soil and season. They will show when and why "topping" or "priming" some time before cutting is, in some cases, in order, and why in others it is not. Some of the cases in which the planter may expect to "top" his plants, may be indicated. If his field be of considerable extent, its surface is likely to be more or less uneven; if it also adjoin a creek, the action of which will, commonly, have contributed to form the soil, it may be underlain in parts by gravelly subsoil; in this case the subsoil will also, commonly, be nearest the

surface at its swales. In any case, the swales will be the "coldest" spots on the field, owing to the moisture settling in them; the same cause will there settle and compact the soil, so that during the later parts of the season the moisture will rise in them less freely; and, finally, if there be a gravelly subsoil which, at these points, is overlain by the thinnest covering of upper soil, all moisture will here first fail and the ground "dry out." On such spots, therefore, plants will be slowest to start, slowest to grow, and first to stop growing. The planter will watch the development of all portions of his crop, and give to each the special management that its own growth calls for. Plants may (and will) grow less luxuriantly in some parts of a field than in others, and yet not require different treatment. They may be going to grow all through the season to its end, to mature their leaves at about the same time with the others; they are only going to give a lighter yield. But if, besides being comparatively stunted, the leaves also begin to yellow, showing bronzed patches when the rest of the general crop is still vivid green; if several pairs of the topmost leaves be small—out of proportion to the others—it may be known that the plant is beginning to fail. It should be topped at once—the stalk being broken off down to the last pair of leaves that are twelve inches long. In ten days or a fortnight, suckers will be started, and should all be taken out. After this a third set will appear, but after these are taken the plant will hardly have the energy to put out any more.

WHEN TO CUT.

The remarks above made as to the possible methods of growth of plants in swales are applicable to plants under any circumstances. But the California planter, who has selected a good soil and got his plants started early, will find them growing vigorously up to the month of August. Before the end of that month, however, the first change toward maturing ought to be visible in the varieties that he may have designed to cure up for bright colors. The lower three pairs of leaves at least ought to exhibit a general bronzing of color, with patches of yellow, and the higher this change may have proceeded on the plant, and the broader the yellowing of the leaves, the better. If the month of September open before the crop begins to exhibit generally this process of maturing, there is a poor prospect of securing bright colors that season. It would often then be better to abandon all idea of it, and the choice is presented between proceeding to cut the crop before the leaves have become too heavy for use in cigar making, or topping so as to get heavy leaves and weight of yield; the dark colors that have become inevitable will now come in due accord with the cigar tobacco, or will be partly compensated by heavy weight. But the Orinoco variety of tobacco is not adapted to cigar making, while the Florida is equally suited for cigars, plug, fine cut, or smoking, according to the condition in which it be cured. For this reason, the planting of Florida seed was recommended for upland in the first paper of this series. It offers the option at this later stage of the season, of making a good cigar tobacco, should it become apparent that a high class article (bright color) for other uses is unattainable. One reason for preferring Connecticut seed leaf to Florida for moist alluvions is, that on such lands dark colors only are likely to be attainable, and when the product of each variety is at its best, the first named ought to be quicker of sale at a better price; and the Connecticut variety also is peculiarly susceptible to change of color

during the process of curing—is more tractable under manipulation in passing to any desired set of shades.

It is not easy to describe the stage of maturity at which tobaccos, intended for the cigar maker's market, may be most advantageously cut. Where it has grown very freely it will be quite ready for cutting about three weeks after the seed stalks have begun to branch. If it has grown more slowly, the maturity of the leaves may be relatively in advance of that of the seed stalk. The nearest I can come to formulating a general working rule for thrifty plants is this: break out the seed stalk at the point of branching when the seeds become fully formed in their pods, and sucker the plants if they then require it. Suckers will start in a few days. Break them out before they have grown so strong as to render the operation one of difficulty. Soon a fresh lot will start. Cut the plant before these shall have grown large enough to interfere with the main leaves in piling and hanging for curing. The old planter recognizes the ripeness of his plants for cutting by a solid granulated appearance of the under side of its leaves, together with their general strength and firmness of texture. It is desirable to cut Havana plants as soon as they become really ripe for it, both because the best quality of tobacco will result, and because a heavier growth will be secured to the second and third cuttings that are yet to be made. At the same time, it will not do to cut too soon, or the leaves will cure up, and be deficient in weight. Although such of them as grade into cigar wrappers will thus, in working up, go much further to the pound weight, and are, for that reason, intrinsically worth more money, yet, in practice, the manufacturer, and not the grower, will secure the benefit of that advantage. A score or so of the thriftiest plants will be selected to save seed from—those that have grown and developed most rapidly and finely—and these are not to be topped. From the time these begin to show brown seeds in the pods, examine minutely the condition and development of all their leaves—the texture, color, appearance, and every discernible quality. At the time the seeds in all the pods are generally brown, the condition and development of the plant may be accepted as the standard for the cutting of cigar tobaccos, and, this condition once learned, the planter will be able, thereafter, to select plants, as they attain this stage, and mark them for cutting.

SECURING SEED.

To secure seed, break out the lateral pod branches of the selected plants, leaving only the central standard to mature seeds. When the pods have become brown, break this off, and hang in a secure place out of the reach of mice. Later, at convenience, rub the pods out in a fine sieve. It is, probably, best to secure a supply of seed for four or five years' planting from the first crop of plants, if fine.

The expense of the operations of topping and suckering is included in the estimated cost of "cultivating," as given last month, at one dollar per thousand plants—an estimate rather in excess of the figure that ought to be realized in practice.

THE RACKS FOR CURING.

At about this juncture opportunity will be found for making the racks on which to hang the plants during the process of curing, to be described in the next paper of this series. Racks to be set up in the

field for this purpose are made as follows: if redwood lumber or Oregon pine be procurable, get two-by-four stuff to cut into seven feet lengths for uprights or standards, four to each rack. Also, one-by-two stuff to cut fourteen feet long, for horizontal pieces. The rack may now be made to hang four courses of tobacco on a side; but if the tobacco be large, requiring about two feet between the courses in order that the ends of the leaves of one course, when the stalks are hung in a horizontal position, may not rest on the stalks of the next course beneath, then it is better to make the racks to hang only three courses on a side.

Ten racks are to be provided for each acre of tobacco to be cut. Each rack will hold two hundred pounds of cured tobacco in plants of good growth—a figure which is easily exceeded.

If the more brittle pine lumber of the Coast Range has to be used, the horizontal pieces must be of one-by-three stuff—the space left between two nailed on the same side of the uprights being increased to five inches; thus, when the opposite piece (now three inches wide) comes to be nailed on, the two open spaces left on each side of it (that is, one above and the other below it), will still be each one inch wide. With this lumber the rack may be increased in length to sixteen or eighteen feet—an increase to be borne in mind in estimating the yield of the crop after hanging on the racks.

Although tobacco can be successfully cured in the field in the method hereinafter described, yet there are advantages in curing it under cover, and it will be well to make use of any available space for this purpose that may be to spare in the barn, wagon-sheds, or elsewhere. This may be done by setting up field racks in the available space, but it will be more effectually availed of, where feasible, by putting up permanent racks, especially around the sides of the structure where they will commonly be quite out of the way when it is to be used for other purposes. Nail around the sides parallel horizontal courses of two-by-two stuff, setting them twelve inches (for Havana) to twenty inches (for large Connecticut) apart. Upon this, at convenient distances apart, set up uprights so that their forward faces shall project two inches beyond those of the two-by-two pieces. Upon these nail other horizontal courses of lumber, so that their upper edge shall be one inch clear below the bottom side of the first (two-by-two) courses. The tobacco will then be hung by inserting the butt of the plant into this space, so that the stalk rests on the top edge of the forward course, while its heel takes against the under side of the rear (two-by-two) course, thus holding it in a horizontal position. If the frame of the barn or shed happens to be of four-inch staff, it will be of the right thickness to nail the forward courses directly upon—the rear courses being then set in, reaching from piece to piece of the frame. The size of the lumber used for the forward courses (which will be some form of one inch stuff) may be of any width, from two or three inches up; but it will be found a great convenience in handling the tobacco to have it not less than six inches wide; thus it will be strong enough to enable the men to make standing room anywhere by simply inserting a piece of board (say two feet long) into the rack, in the same way the stalks are inserted. Unless this can be done, they must use board or plank long enough to reach from the rack to some other support, which cannot always be conveniently arranged.

If the planter have some board lumber on hand he can improvise cover for his tobacco in the field as follows: set one rack atop of

another, so that the top courses of the upper rack may serve as a ridge-pole; then on each side set parallel racks on the ground.

The invention of these racks, and of the process of hanging the plants in a horizontal position, are patented by the Governments of the United States and other countries to James D. Culp, of Santa Clara County, California, whose patented rights are conveyed to the Consolidated Tobacco Company of California, which grants the privilege of their use on terms of royalty; that is, of a percentage of the tobacco cured. Planters who prefer not to pay the royalty may follow the old-fashioned ways of splitting or spearing the stalks, and hanging them butts upward. But a material saving in labor is effected by hanging on the rack, to say nothing of other advantages which will be obvious to the old planter.

WOOL REPORT FOR THE YEAR 1874.

WOOL REPORT OF E. GRISAR & CO.

FOR THE

YEAR EIGHTEEN HUNDRED AND SEVENTY-FOUR.

WOOL PRODUCTION.

Receipts at San Francisco.	Bags.	Pounds.
January	1,226	
February	429	
March	967	
April	15,622	
May	32,982	
June	7,483	
July	3,224	
August	3,607	
September	13,806	
October	23 873	
November	8,782	
December	921	
Total	112,922	
Of which there was Spring wool 61,112 bags, weighing		18,639,160
Spring wool shipped direct from the interior		1,998,116
Bought by country factories		425,000
Total Spring production		21,062,276
There was Fall wool received 51,810 bags, weighing		16,371,960
Fall wool shipped direct from the interior		593,545
Bought by country factories		120,000
Total fleece wool		38,147,781

Receipts at San Francisco.	Bags.	Pounds.
Brought forward		38,147,781
Pulled wool shipped from San Francisco		1,211,000
Total production of California		39,358,781
On hand December 31st, 1873, about		3,000,000
Received from Oregon 7,652 bags		1,721,700
Foreign wool received, 2,209 bags		574,340
Grand total		44,654,821

COMPARATIVE PRODUCTION.

	1874.	1873.	1872.	1871.
Spring—pounds	21,062,276	18,049,519	14,550,980	13,134,680
Fall—pounds	17,085,505	12,905,650	8,554,488	9,052,508
	38,147,781	30,955,169	23,105,468	22,187,188
Oregon—pounds	1,721,700	1,666,300	1,175,600	921,000
Totals	39,869,481	32,621,469	24,281,068	23,108,188

EXPORTS—DOMESTIC, FOREIGN, PULLED, AND SCOURED.

		Pounds.
Per rail, inclusive of shipments from the interior		32,020,228
Per steamer, inclusive of shipments from the coast		3,117,750
Per sail		950,723
Total number of pounds		36,088,701
Value of exports	$8,182,000	
On hand December 31st, 1874, 20,832 bags		6,458,000

The weights of receipts and exports are gross. The usual tare of bags received is about three pounds each; on pressed bales shipped, fourteen to sixteen pounds each.

Fully two thirds of the wool graded during the past year is A 1; the balance is A 2 and B. This proportion has been unchanged for the past five years.

The Spring clip was above the average of several preceding seasons in staple and condition. Southern wools especially were remarkable for their good condition and comparative freedom from bur. In the wool from other sections the improvement was less marked. The Fall clip has not been equal to that of eighteen hundred and seventy-three. The condition is poorer, in consequence of sheep farmers having bred more for fine heavy wool than formerly, which naturally retains more dust than open wool of a coarser fiber. The fact, also, of valley lands having become too valuable for sheep raising, has driven the flocks into the mountain districts, where more seeds are found, and consequently very little Fall wool is now free.

The demand throughout the year has been for wools of good staple. Southern wools in the Spring met with ready sale, because the length of staple was thought to more than counterbalance the burs they contained. Short-stapled fine wools are the last to move, as they are only suitable for a few kinds of manufactures.

The wide-spread introduction of Merino blood into the flocks of the State is now making its effect apparent in the increased amount of short fine heavy wool. Such wools are not suitable for fine goods, because the staple is too short, and they are usually defective. For common goods they are too expensive, as the shrinkage is heavy, on account of the quality, and the staple is also too short. Long-stapled wools, of medium grade, are in demand during Spring and Fall, and it is to the production of such descriptions farmers should turn their attention, if they want to have their wools meet with ready sale. The agitation now going on for a revision of the tariff on wools and woolens, should cause wool growers to pay attention to the wants of consumers.

As the wool product of the State increases, the time in which it is disposed of becomes longer, so that in future this market will seldom be entirely bare. The stock of Fall wool in store at the beginning of the year was unusually large. An active demand, which continued during January and February, was sufficient to take nearly all of it, so that when Spring wool began to arrive, it came upon a bare market. The first receipts of the Spring clip were so superior to the preceding year, in condition, staple, and freedom from defects, that they were taken quickly, at prices considerably above the rates of the year before. The scarcity of domestic and foreign wools in the Eastern markets turned the attention of consumers to California for supplies until other domestic wools should arrive. The presence of an unusually large number of Eastern buyers caused an active competition, and prices gradually advanced throughout the season. Although the production was larger than ever before, and was brought into market more quickly than usual, there was no accumulation, except from the inability of the packers to forward the wools. The shipments East during April and May largely exceeded that of any previous year during the same time. By the middle of June very little wool remained to be marketed.

Fall wools began to arrive in September, and at first met with ready sale. The market gradually advanced to the point of restricting operations, while at the same time the condition of the Eastern markets was unfavorable. Wools began to accumulate, and this continued until stocks were larger than ever before. During the past month a demand has sprung up, and supplies have been somewhat reduced, but they are still greater than usual.

The large amount of Fall wool this season has astonished everybody. It shows that the farmer, expecting good prices, has shorn every sheep,

and that is the reason that our Fall wool this year has given so little satisfaction; the bulk of it being short in the staple, full of earthy and vegetable substances, thereby rendering it unfit for most purposes in manufacturing. In addition to this fact, the failure of some of the manufacturers who used most of these wools, will account for the large quantity of Fall on hand at this date.

It is, therefore, established beyond a doubt that it behooves our wool growers here to shear as little Fall wool as possible, and pay more attention to staple and condition of the Spring clip, as good stapled and well-conditioned wools find a ready market at all times, while short, faulty wools are only taken up when nothing else can be had.

Australia and South America raise better fine wools than California, and can afford to sell their productions at lower rates. Wools of medium quality are in better demand and are in smaller supply. To raising such descriptions, the grower here should turn his attention; as land becomes more valuable, it will pay the farmer to grow only such descriptions as will sell readily and bring a good return.

The condition of Oregon wools was better than usual, and they were taken readily at full rates.

PRICES IN GOLD OF "A 1" CALIFORNIA WOOL IN SAN FRANCISCO DURING THE PAST EIGHT YEARS.

MONTHS.	1867.		1868.		1869.		1870.	
	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.
January	Nominal.	13 to 14	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.
February	Nominal.	13 to 14	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.
March	Nominal.	12½ to 13	16 to 17	Nominal.	Nominal.	Nominal.	18½ to 19½	Nominal.
April	20 to 22	Nominal.	16 to 18	Nominal.	18 to 21½	Nominal.	17½ to 20	Nominal.
May	18 to 22	Nominal.	16½ to 19½	Nominal.	18 to 21½	Nominal.	17½ to 21	Nominal.
June	18 to 21½	Nominal.	18 to 19	Nominal.	18 to 21	Nominal.	17½ to 21	Nominal.
July	16 to 19	Nominal.	16 to 19	Nominal.	18 to 21	Nominal.	18½ to 21	Nominal.
August	15 to 18½	12 to 12½	17 to 19	Nominal.	17½ to 20	13 to 15	Nominal.	13 to 16
September	15 to 18½	12 to 12½	Nominal.	13 to 15	17½ to 20	13 to 15	Nominal.	16 to 18
October	14 to 18	11 to 12	Nominal.	16 to 17	17½ to 20	12½ to 14	Nominal.	16 to 19
November	14 to 17	10 to 11½	Nominal.	17 to 19½	Nominal.	12½ to 14	Nominal.	16 to 19
December	14 to 17	10 to 11½	Nominal.	17 to 19½	Nominal.	12 to 13½	Nominal.	16 to 19

PRICES IN GOLD OF "A 1" CALIFORNIA WOOL IN SAN FRANCISCO—Continued.

MONTHS.	1871.		1872.		1873.		1874.	
	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.
January	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.	19 to 23	Nominal.	19 to 21
February	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.	19 to 21
March	25 to 26	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.
April	26 to 28	Nominal.	45 to 50	Nominal.	19 to 21	Nominal.	21 to 25	Nominal.
May	28 to 32	Nominal.	Nominal.	Nominal.	19 to 21	Nominal.	21 to 27	Nominal.
June	27½ to 33	Nominal.	30 to 35	Nominal.	20 to 22	Nominal.	22 to 28	Nominal.
July	26 to 33	Nominal.	33 to 37	Nominal.	22 to 24	Nominal.	19 to 25	Nominal.
August	26 to 32	28 to 32	Nominal.	Nominal.	22 to 25	16 to 18	20 to 22	Nominal.
September	Nominal.	26 to 32½	Nominal.	17 to 19	22 to 25	18 to 21	Nominal.	18 to 21
October	Nominal.	25 to 28	27 to 32	18 to 20	Nominal.	18 to 19	Nominal.	15 to 19
November	Nominal.	23 to 26	30 to 32	19 to 21	Nominal.	17 to 19	Nominal.	15 to 18
December	Nominal.	21 to 25	30 to 33	19 to 21	Nominal.	18 to 20	Nominal.	15 to 17

PRICES IN GOLD OF "A 1" CALIFORNIA WOOL IN NEW YORK DURING THE PAST EIGHT YEARS.

[Compiled by James Lynch, Wool Broker, New York, for E. Grisar & Co.]

Months.	1867.		1868.		1869.		1870.	
	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.
January	21 to 24	20 to 23	18 to 20½	16 to 19	25½ to 27	21 to 22	22½ to 25¼	17½ to 18¾
February	20 to 24	20 to 22	21 to 23	15 to 18½	25½ to 27	21 to 22	24 to 24¾	17¾ to 19¼
March	23 to 25	21 to 24	21 to 24	17 to 20	26 to 28	21 to 25½	24¼ to 26	19½ to 21½
April	20 to 23	20 to 23	21 to 25	18 to 20	25 to 27	19 to 22	25½ to 26½	19 to 21¼
May	20 to 24	19 to 22	22 to 25	17½ to 19½	23½ to 26	17½ to 20	24½ to 26¼	18½ to 19¼
June	20 to 23	18 to 23	21 to 24	17 to 19½	21½ to 23½	16½ to 18½	26¼ to 27	19¼ to 20¼
July	20 to 23	17½ to 19	19 to 23	17 to 20	22 to 25½	16½ to 17½	23 to 26	19¼ to 19¾
August	18½ to 21	17 to 19	18 to 22½	17 to 20	22 to 25½	13¼ to 19	24 to 27½	18¾ to 19¾
September	19 to 22	18 to 21	20 to 23	18 to 22	21½ to 25	16 to 18½	24¼ to 27¾	18½ to 19¼
October	19 to 23	18 to 20	22 to 26½	20 to 23	23 to 26	15½ to 18½	23¾ to 25¼	18½ to 19½
November	18½ to 22	18 to 20	22 to 26½	20 to 23	22½ to 25½	16 to 18	26¼ to 27¾	21¼ to 25
December	18½ to 22	16½ to 18½	.....	.....	22 to 25	16 to 17½	26¼ to 27½	22 to 22¾

PRICES IN GOLD OF "A 1" CALIFORNIA WOOL IN NEW YORK—Continued.

MONTHS.	1871.		1872.		1873.		1874.	
	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.
January	26¼ to 29¾	22½ to 25½	36 to 41	32 to 36	33 to 40	24 to 28½	26 to 32	22 to 26
February	27 to 30½	22½ to 25¼	37 to 42	32 to 37	30 to 37	21 to 26½	26 to 32	21½ to 26
March	27 to 31½	20¾ to 24¼	40 to 45	33 to 38	28 to 35	19 to 26	26 to 31½	21½ to 26
April	27 to 31½	21½ to 24¼	38 to 43	32 to 37	23 to 29	16 to 22	26 to 31	20½ to 25
May	29¾ to 33	23¼ to 27	37 to 42	28 to 33	22 to 27½	15½ to 21½	26 to 31	20½ to 25
June	31¼ to 38¼	28½ to 32	37 to 42	26 to 31	22 to 27	15½ to 18½	27 to 32	20½ to 25
July	31 to 38¼	29½ to 30¼	35 to 40	24 to 28	22½ to 28	15½ to 19	26 to 33	21 to 25½
August	32 to 40	26¾ to 31¼	34 to 39	22 to 25	22½ to 28	15½ to 19	26 to 33	21 to 25
September	30¾ to 38½	28 to 32½	33 to 38	21 to 24	24 to 29½	17½ to 21	26 to 32	21 to 25
October	29¾ to 37½	28 to 32¼	31 to 36	21 to 24	25½ to 30½	20 to 24½	26 to 32	20 to 24½
November	31½ to 39½	29¾ to 35	33 to 40	22 to 26	25 to 30	20½ to 25	25 to 31	19 to 24
December	31¾ to 40	30 to 36¼	33 to 40	24 to 28	25 to 29½	20½ to 25	24½ to 30½	19 to 23½

The above is for wool *not burry*. Exceptional lots, as to staple and condition, brought higher and lower prices than above given. There is a wide range between choice long-stapled bright clips and short and wasty ones. It is a fact to be regretted that the bur is spreading, and this year the wool, both Spring and Fall, is more affected with it than at any time hitherto.

EXPORTS.

The exports of leading articles of California produce, together with treasure—exclusive of duties—have, for the past twelve years, been as follows:

	1863.		1864.		1865.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Treasure	.....	$46,033,961	.....	$55,202,423	.....	$45,484,546
Quicksilver, flasks	26,060	966,748	37,252	1,527,963	41,256	1,733,283
Flour, barrels	156,099	815,241	128,086	876,393	109,210	701,556
Wheat, 100-lb sacks	1,176,086	1,948,646	435,221	771,968	416,595	847,534
Feed grain, 100-lb sacks	130,957	271,315	46,796	112,088	166,027	201,514
Wool, pounds	5,268,480	1,225,151	5,935,670	1,254,778	6,549,931	1,334,425
Hides, number	312,439	1,124,156	338,281	1,064,073	330,361	1,051,317
Tallow, packages	3,043	107,358	1,041	26,474	31	1,038

EXPORTS—Continued.

	1866.		1867.		1868.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Treasure	.....	$44,786,577	.....	$40,682,990	.....	$56,358,091
Quicksilver, flasks	30,789	1,082,940	28,824	929,726	43,507	1,330,054
Flour, barrels	327,545	1,855,108	519,428	3,178,598	465,273	2,973,538
Wheat, 100 lb sacks	2,258,022	4,185,598	4,604,080	9,340,497	4,071,837	8,635,854
Feed grain, 100-lb sacks	481,319	677,120	78,766	82,857	86,965	184,578
Wool, pounds	4,662,129	897,938	7,057,631	1,143,571	13,225,181	2,436,594
Hides, number	169,307	546,694	89,693	329,667	74,274	282,160
Tallow, packages	777	16,311	1,752	29,541	1,898	31,411

Exports—Continued.

	1869.		1870.		1871.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Treasure	.....	$37,287,117	.....	$33,618,402	.....	$36,332,083
Quicksilver, flasks.	24,365	747,671	12,059	402,051	11,244	852, 25
Flour, barrels	427,425	2,058,919	221,945	1,179,279	246,877	1,542,209
Wheat, 100-lb sacks	5,011,020	8,734,348	4,197,397	7,974,345	1,311,762	3,185,348
Feed grain, 100-lb sacks	339,614	384,068	167,920	204,174	18,434	33,850
Wool, pounds	13,747,791	2,370,165	19,238,000	3,655,000	22,064,638	6,067,775
Hides, number	109,165	371,346	102,280	393,873	82,225	346,346
Tallow, packages	387	9,708	.....	.....	.....	.....

EXPORTS—Continued

	1872.		1873.		1874.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Treasure	.....	$28,085,850	.....	$24,223,726	.....	$30,838,395
Quicksilver, flasks	14,721	875,414	6,169	462,495	5,388	539,525
Flour, barrels	1,275,892	1,339,830	473,296	2,861,039	623,062	3,405,231
Wheat, 100-lb sacks	5,859,920	10,331,082	9,120,110	18,476,505	8,279,380	14,094,346
Feed grain, 100-lb sacks	162,643	217,049	242,198	378,576	66,422	61,995
Wool, pounds	24,578,980	7,750,000	29,235,376	6,450,352	36,088,701	8,182,000
Hides, number	39,818	113,281	25,552	343,099	102,857	584,092
Tallow, packages	.....	.....	.....	.....	.....	.....

Respectfully, yours,

E. GRISAR & CO.

SAN FRANCISCO WOOL EXCHANGE, January 1st, 1875.

JERSEY CATTLE.

PRIZE ESSAYS ON JERSEY CATTLE.

[As the dairy interest of the State is attracting much attention, and in point of importance is second to no other, the following prize essays on Jersey cattle, taken from volume three, American Jersey Cattle Club Herd Register, will be found interesting, as well as giving much information in regard to this truly valuable breed of cattle, of which as yet in California there is little known.]

At the annual meeting of the American Jersey Cattle Club, held in April, eighteen hundred and seventy-four, the undersigned were appointed a committee for the purpose of procuring and publishing prize essays on the subject of Jersey cattle. The offer of prizes was accordingly advertised in various agricultural journals; and, on or before the first of December, four essays were received, two of which were judged worthy of publication. A prize of two hundred and fifty dollars was awarded to George E. Waring, Jr., and one of one hundred dollars to L. S. Hardin.

While the committee are of opinion that these essays are, in the main, sound in principle and correct in fact, they do not undertake to indorse or to give by implication the sanction of the Club to all the views and statements of the writers. They submit the papers—with some omissions and slight alterations—to the judgment of the reader, believing them to be replete with interesting and valuable information on the subject of Jersey cattle, and hoping for them a wide circulation, not only among Jersey breeders and owners, but also among dairymen generally, and all who are interested in improving the various breeds of cattle in this country.

J. MILTON MACKIE,
R. GOODMAN,
DAVIS COLLAMORE,
THOS. J. HAND.

JERSEY CATTLE

FOR

THE DAIRY, THE HOUSEHOLD, AND THE LAWN.

Prize Essay, by George E. Waring, Jr.

THE IMPROVEMENT OF RACES OF CATTLE.

The improvement of various breeds of cattle has been actuated by certain specified needs, and has enlisted the close attention of men who, devoting themselves to one object, have worked with all the persistence of enthusiasts, and have accomplished results far beyond any conception of progress which the founders of the improvement could have imagined.

The desire for a race of beef cattle which should arrive at early maturity, and should present a carcass having the heaviest weight of flesh in the more valuable hind-quarters, led to the foundation of the Short-horn race, and has developed a class of breeders whose enthusiasm may well be called wild—an enthusiasm which stops at no extravagance of price, and which bears the loss of animals costing thousands of dollars without discouragement. The aim has been followed with an entire singleness of purpose. Beef, and beef only, has been the aim from the outset. Shy-breeding, very defective lactation, and not seldom a weakening of the constitution, have all been more or less disregarded. The result, as a matter of meat at a very early age, has been such as could have been attained by no other process than that of a complete disregard of every qualification except the one sought.

In like manner, special breeders of Ayrshire and Dutch cattle have concentrated their energies upon an enormous and persistent flow of milk, pursuing their aim with such dogged perseverance that they have obtained a yield that the wildest enthusiast of a hundred years ago would not have deemed possible.

Other races in other countries have had their adherents, who have labored with equal success in the development of special characteristics.

Within the past thirty or forty years a hardly less persistent effort has arisen among another class of breeders to develop a cow of great beauty, gentleness of disposition, continuous milking, and of extreme richness of product. This effort took its rise in the Channel Islands, and notably in Jersey, encouraged and seconded first in England, and afterward in this country. The question of beauty has concentrated it very largely—we may say, so far as we are concerned, almost exclusively—on the cattle on the Island of Jersey; and although yet in its comparative infancy, there can be no doubt that its results will be as remarkable and as far beyond the early standards set up, as even in the case of the Short-horn.

THE ORIGIN OF THE JERSEYS.

The origin of these cattle is exceedingly obscure. They probably came first from Normandy and Brittany with the early settlers, perhaps a thousand years ago; but their characteristics are now quite different from those on the mainland, and are doubtless an outgrowth of climate, soil, and habit. If we could imagine France to have been the center from which the cattle spread with the movement of the Gauls to the east and south, and of the Normans to the Channel Islands, we should find a remarkable instance of the development of original characteristics in opposite directions. Throughout Eastern France, Southern Germany, and Northern Italy, the cattle are very largely—in some wide districts almost universally—of solid color, with black switches, mealy noses, and rather coarse horns. They are somewhat larger and more beefy than the animals of Western France; and, as even the cows are regularly worked, their product of milk seems to be neither very large nor very rich. In the Channel Islands, while the same general characteristics are to be traced, the question of color has obviously been disregarded, and a large majority of cattle have more or less white disposed in patches, white switches more often than not, white legs and feet, finer horns, and much less size and fleshiness; on the other hand, they are, for their size, very large milkers, their milk is of an extreme richness, and their leanness and general want of force are such as might be expected of animals which do no work—not even the comparatively light work of roaming over pastures.

THE FORMATION OF THE TYPE.

Perhaps if we were to seek for the radical cause of the great difference in flesh and in milking quality between these animals and their more eastern congeners, we should find it in this very question of physical work. The theories on the subject are not sufficiently well established for scientific certainty, but it seems probable that the development of muscle by physical exercise tends to divert the nutriment of the food to the formation of flesh, leaving less to enlarge the quantity and enrich the quality of the milk. Perhaps, too, the degree to which the fat-forming portions of the food are converted into cream in the udder bears some relation to the demand which the lung-action makes upon these substances to supply carbon for oxidation in the process of breathing. It is a well known fact that a cow driven long distances to and from pasture produces less butter than one leading a more indolent life, and the inference is that the increased respiration in this case consumes hydrocarbons of the food, which, if not so destroyed, would be con-

verted into butter. Assuming this to be true, may we not infer that an animal whose lungs have been enlarged by generations of work or exercise, breathing more largely because of greater lung capacity, oxidizes and expires a larger amount of the very elements required for the production of butter? However true this theory, the facts on which it is based are unquestionable. The similarity of type between the cattle of Jersey and those of South Germany, and the fact that in the one case where they remain indolent throughout their whole lives, and in the other where they are almost constantly at work in the yoke, their yield of butter is very different, would seem to indicate the soundness of the reasoning.

EARLY EXCELLENCE.

Before the beginning of this century, say more than one hundred years ago, the cattle of Jersey had a well-recognized character as a distinct race, peculiarly adapted for butter making, and qualified by their great docility for the system of small cultivation which has always characterized that island. As long ago as the year seventeen hundred and eighty-nine, they were considered so superior for the uses required in Jersey to any other known breed, that an Act of the local Legislature was passed, by which the importation of all foreign-bred cattle—cow, heifer, calf, or bull—was prohibited, under heavy money penalty, in addition to the forfeiture of the vessel and its tackle, and a considerable fine to be imposed on every member of the crew who did not inform the authorities of the attempt to violate the law. Every animal so arriving was decreed to be immediately slaughtered, and its flesh to be given to the poor. Subsequent enactments have been equally rigorous, and no foreign cattle are allowed to be landed in Jersey except as butchers' meat. This restriction does not apply to cattle from the Island of Guernsey; but these are so little esteemed by Jerseymen that there are rarely a dozen Guernsey cows to be found in the whole island.*

ACTION OF THE ROYAL JERSEY AGRICULTURAL SOCIETY.

Aside from this prohibition against the importing of cattle of other races, there seems to have been no regulated effort to improve the breed until about eighteen hundred and thirty-four, when a committee of the Jersey Agricultural Society selected two of the finest cows as models. One of these was held to be perfect in her head and fore-quarters, and the other in her udder and hind quarters. From these two animals there was drawn up a scale of points to guide the judges at the island and parish exhibitions in selecting the best animals among those competing for prizes. The scale of points thus determined upon, with one or two unimportant additions since made, will be given in another part of this essay.

So strong was the adherence of the Jersey farmers to the single point of milking superiority, that for a long time, and in many cases, even to the present day, they sought no further. Their cattle had always possessed the deer-like head, the fine, crumpled horns, the yellow secre-

* It is only fair to say that the farmers of Guernsey reverse this estimate, and have no high opinion of the Jersey cows. This mutual prejudice has almost the effect of a legal enactment to prevent an interchange of stock between the two islands. The writer has been unable to learn that there has ever been an interchange of bulls.

tions in the ears, the soft eyes, the lean throat and neck, the light frame, the fine tail, and, above all, in the better specimens, the large, well-formed udder, with prominent, knotted milk-veins, which indicate the largest and richest production at the pail. Even now there are to be found in Jersey a very large number of ill-formed, slab sided cows, hollow-backed, cat-hammed, and sloping at the rump, which show how largely the points of beauty have been neglected.

Nevertheless, the stimulus of the English and the American demand, and the desire for success in competition at the periodical shows, have had, and are still having, a great influence on the form of the animal. The awkward, ungainly shapes are disappearing, and there is a constant improvement in general outline, though even to this day the great point to be considered in all breeding in Jersey is the production of a good yield of butter. This has been somewhat interrupted during the past few years by the mania for dark colors; but the mischief thus caused promises to be fleeting, and, under the strenuous efforts of the society to discourage this folly, it is not likely that any serious injury to the race will result.

THE DEVELOPMENT OF THE JERSEYS.

Whatever may have been the origin of this race (and what is said above is only one of the theories on the subject), their development to their present condition is a natural outgrowth of the circumstances under which they have been kept.

To understand this properly is important to all breeders of the race in this country, for the reason that, so far as we are to continue the improvement under influences similar to those which operated for so long a time in the development, we should, as nearly as our conditions will allow, conform to the circumstances of the original breeding and treatment. The Jersey cow is a product of the Island of Jersey—of its soil, its climate, its system of agriculture, the circumstances of its farmers, and the needs of the dense population there concentrated.

DESCRIPTION OF JERSEY.

The group known under the general name of the Channel Islands lies in the English Channel, north of Brittany, and opposite the west coast of Normandy, from which they are but little removed. They originally formed a part of the Duchy of Normandy, and were a part of the possessions of William the Conqueror when he became the King of England. When Normandy was restored to France, these remained English possessions. The largest and southernmost island is Jersey, which is forty miles north of the coast of Brittany, and sixteen miles west of the coast of Normandy. The strong tides by which it is washed are greatly tempered by the influence of the Gulf Stream, which modifies its climate to a remarkable degree.

Its length from east to west is eleven miles, and its breadth from north to south about seven and a half miles. Its entire area is about sixty-two square miles, or thirty-nine thousand six hundred and eighty acres. Its highest elevation above mean tide is about three hundred feet. The entire north coast is a high, rocky bluff, much indented with bays, and with no considerable streams flowing in that direction. The west coast is of a similar character, and scarcely lower. The southwestern coast is also mainly high bluff land, this continuing along a portion of the southern shore, which extends further into the sea than the shore to the east

of it. The length of this south bluff is three or four miles. The remainder of the southern shore, and a large part of the eastern, lie but little above the level of the sea. From the north and the west the land descends gradually, being divided by frequent valleys, with rills and brooks, quite to the southern coast, so that the general exposure is a little east of south, and well sheltered by high bluffs on the northwest and southwest coasts from violent winds, aiding materially in the modification of the climate.

The whole island is of about the same size with Staten Island, near New York. It is divided into twelve parishes, each under its own local government, the whole being ruled by a Legislature which, for local government, is comparatively independent of the British Parliament. Of course, in so small a country, there must be considerable uniformity of habits, customs, and language, throughout all its parts; and the local differences which exist, although they affect even the language of the people, need hardly be considered in this description.

THE FARMING.

About twenty-five thousand acres of the island are under cultivation, or are used for pasturing. The population is about fifty-six thousand, or more than two persons for each acre of available land. The farms are generally very small, and the local law of succession tends to their still further division, although beyond a certain point this tendency is checked by purchase. There are not more than six or eight farms in the island of over fifty acres; the usual size is from fifteen to twenty acres, but a very large part of the population occupy very much less land, often only two or three acres. Even the smallest farmers, occupying less than two acres of land, keep a cow, swine, and some poultry. One result of this minute subdivision has been the cutting up of the whole island into very small fields, many of them orchards, and nearly all surrounded with earth fences, on the top of which grow the trees that supply a considerable part of the fuel used.

Even these small farmers are widely distinguished from the poorer peasantry of other parts of Europe; indeed, they are called "gentry," and they hold their little estates by descent from very old families. Being gentry, they have some of the characteristics of wealthier gentlefolks, and attach much importance to comfortable and respectable living. This ambition is made easy to gratify by the fertility of the soil, the abundant sea-manure, an almost perfect climate, and the fact that the best market in the world (London) is practically at their very doors, to say nothing of the Town of St. Heliers, where more than one half the population resides, and which depends largely upon the island itself for its supply of food.

The popularity of their cattle in foreign countries during the past few years has added much to the prosperity of Jersey farmers.

It would be difficult to find anywhere else such a universal adoption of what may be called "high farming" on a small scale. A very good idea of the agriculture of the island may be obtained from the following account, given by Mr. Le Cornu in his prize essay, published in the *Journal* of the Royal Agricultural Society of England. He says:

"A farm of twenty acres will, with few exceptions (where meadow land or orchards predominate), be distributed as follows:

	Acres.
Hay and pasture	10
Turnips	2
Mangolds	1
Parsnips	1
Carrots	0¾
Potatoes	2
Wheat	3¼
	20
The stock usually kept will consist of—	
Horses	2
Cows	6
Heifers	6
Pigs	8

"To manage the above, and keep the whole in proper order, will require the constant attention of four persons—two men and two women. In most cases the farmer has no recourse to any assistance beyond that of his own immediate household; it is, indeed, a rare occurrence for a tenant-farmer to hold a farm of this extent, unless he can rely upon his own family for assistance."

The high farming pursued is very different from that prevalent where larger areas are treated, and where there is abundant capital for the work. It is rather that of garden cultivation, where the utmost use is made of the capacity of every field, and where deep plowing, heavy manuring, and careful attention, produce their very best effect. These farms have often an untidy and ill-kept look about the fence corners and the old thatch-covered stone sheds; but the available land itself is a picture of the neatest and most effective cultivation. Even the smaller places have a full supply of out-buildings—stable, cow-house, sties, sheds, barns, cider-house, and bake-house—conveniently disposed, and according with the size of the farm.

As on these small farms the horses kept are not sufficient for the deep plowing practiced, farmers join their teams and make a festival, not unlike our corn-huskings, for the annual preparation of the land for growing roots—a preparation which exerts its influence on the subsequent rotation of crops, and on the final product of grass.

THE CLIMATE.

After the great fertility of the soil, the agricultural prosperity of Jersey is most indebted to its remarkable climate. This is due to the circumstances above hinted at, but it is difficult to understand how these should have so great influence. Softer skies and milder Winters it would be hard to find. Variations of temperature are gradual and slight. It is never cold in Winter and rarely hot in Summer. The

vegetation growing in open air in ornamental grounds is the best index to this mildness. For example: the fuchsia grows to a great size, even running along the eaves of low, two-story cottages, and is perfectly hardy; this, and sometimes even the camellia japonica, is used as a hedge plant. The semi-tropical ferns, which are entirely unknown in Virginia, grow here with great luxuriance. The yucca, the agave, the oleander, and the azalea, flourish in the open air. The orange and the lemon ripen without protection. The camellia japonica blooms throughout the Winter. The grass is green and nutritious all Winter, and the laurustinus blooms in December. The luxuriant vegetation of the Norfolk Islands grows vigorously, and it would hardly be too much to say that the native trees and shrubs of our extreme Southern States are quite unharmed by the Winters of Jersey. While, however, all these plants are successfully grown without other protection than shelter from high winds, the absence of intense Summer heat is favorable to the vegetation of the north, and the pine and oak grow as well as under their native skies.

THE CATTLE.

It is under the fostering influence of this careful agriculture, and of this genial climate, that the Jersey cow has grown to be what she is—a small, docile, useful, domestic animal. She has long been jealously guarded by the Jerseyman as the best cow in the world for his purposes, and it was a wise decision which led the Legislature to confine the improvement of the race within the line, rather than yield to the infusion of alien blood. The secret of their great development in the matter of the production of cream and butter has been sought in the fact that, perhaps for hundreds of years, no other characteristics were considered in their selection. The old unimproved cattle, of which specimens are still to be seen on the island, were exceedingly awkward and ungainly, and had little to recommend them besides their little heads, which no neglect had been able to spoil, and their all-important quality of rich productiveness.

Their most useful characteristics are the effect of continual breeding for a useful result; but their gentleness, their docility, and their beauty—which, when we consider their adaptation for family use, are of an importance only second to this—are due to long generations of kind, personal care, and of the constant presence of man, or rather of woman; for in Jersey the women take almost exclusive charge of the cattle. From their very birth these animals are never at liberty; when in the fields, they are always tethered by short ropes to stakes in the ground, and are removed several times a day to fresh grass; they are led to water, and they are led to the stable.

Bearing in mind the smallness of the island, and the fact that it has over two thousand land owners, one may well be surprised to learn that the census of eighteen hundred and seventy-two returned nearly eleven thousand head of horned cattle as being kept there.

METHOD OF FEEDING AND TREATMENT.

We cannot do better on this point than to quote the account of Mr. Le Cornu in the article above referred to:

"In order to derive the greatest possible advantage from his cows, the Jersey farmer endeavors to arrange for them to calve during the first three months of the year; that is, when vegetation speedily advances. In the Winter cattle are always housed at night; when they come in (about four o'clock in the afternoon), they are milked, after which each receives about three fourths of a bushel of roots and a little hay; they are then left until eight o'clock, when a bundle of straw is given to each one. The following morning they are attended to at six o'clock, or even before that hour; having been milked, they again receive the same allowance of roots and hay as before mentioned, and at nine o'clock are turned out; if fine, in some sheltered field or orchard; then the stables are cleaned out, and the bedding renewed, if required. Cows are dried one month or six weeks before calving. Bran mashes are given to them about the time of parturition, and continued for a fortnight after the calf is born; at no other time do they receive this food. Bull calves intended for the butcher receive the cow's milk for about a month or six weeks; then they are considered fit for sale. A good calf will sell for about fifty shillings, some for more, but many for less. If the calf be a heifer, she is always reared and kept in the island until she is two years old, when, if not required, she is sold for exportation.

"Returning to the cow: two weeks or so after calving, if the weather be very fine, she is turned out to grass in the daytime. It is the custom in all the Channel Islands to tether cattle. The tethers are made of small chain; a spike about one foot long is attached at one end and driven into the ground; the other end is tied to the cow's halter, the latter being made fast at the base of her horns; the length of these tethers is altogether about four yards. During the day cattle are frequently moved, generally every three hours, and sometimes oftener; drink is given to them in the morning on leaving the stable, and at noon; if it be Summer time, they receive it also in the evening. About the month of May they are allowed to remain out at night, and continue so until the end of October, when the system of housing above described recommences. During the Summer cows are frequently milked three times a day; and when the weather becomes very warm, they are brought into the stable for a few hours, else they would be tormented by flies. At this period (height of Summer) a great diminution takes place in their milk; but as the heat ceases toward the Fall, it rapidly springs up again to what it was in the Spring. This is the time when butter is crocked for Winter supply. A cow is in her prime at six years of age, and continues good until ten years old; many are kept that are much older, but then they begin to fall off. A good cow on the average gives fourteen quarts of milk per day, or eight or nine pounds of butter per week; instances are common of cows giving twelve, or even fourteen, pounds of butter in one week, but that is above the average figure."

THE DAIRY IN JERSEY.

Jersey dairies are not altogether the best models to be followed. They are generally small, and their product is inferior in quality to that of American dairies of the better sort where Jersey cows are kept. The implements used for setting milk, etc., are of earthenware, and are sometimes not as scrupulously clean as they should be. The quality of the butter in the St. Heliers market is, as a general thing, not particularly

fine, although it has, of course, the firmness and wax-like consistency peculiar to the product of this race of cattle.

In one respect the practice in Jersey is worthy of imitation; the milking pail is not used, but in its place a narrow-mouthed, big-bellied can. Over this is tied a piece of thin linen cloth, sagging well into the opening, and in which lies a sea-shell to receive the stream of milk and prevent its wearing out the cloth. The milk overflows the shell, and is immediately strained through the cloth, and is protected from dust and from the odor of the stable.

SCALE OF POINTS

(AS ADOPTED BY THE ROYAL JERSEY AGRICULTURAL AND HORTICULTURAL SOCIETY.)

BULLS.

	Article.	Points.
1.	Head, fine and tapering	1
2.	Forehead, broad	1
3.	Cheek, small	1
4.	Throat, clean	1
5.	Muzzle, fine, and encircled by a light color	1
6.	Nostrils, high and open	1
7.	Horns, smooth, crumpled, not too thick at the base, and tapering, tipped with black	1
8.	Ears, small and thin	1
9.	Ears, of a deep orange color within	1
10.	Eyes, full and lively	1
11.	Neck, arched, powerful, but not too coarse and heavy	1
12.	Chest, broad and deep	1
13.	Barrel, hooped, broad and deep	1
14.	Well-ribbed home, having but little space between the last rib and the hip	1
15.	Back, straight from the withers to the top of the hip	1
16.	Back, straight from the top of the hip to the setting-on of the tail, and the tail at right angles with the back	1
17.	Tail, fine	1
18.	Tail, hanging down to the hocks	1
19.	Hide, mellow and movable, but not too loose	1
20.	Hide, covered with fine, soft hair	1
21.	Hide, of good color	1
22.	Fore-leg, short and straight	1
23.	Fore-arm, large and powerful, swelling, and full above the knee and fine below it	1
24.	Hind-quarters, from the hock to the point of the rump, long and well filled up	1
25.	Hind-legs, short and straight (below the hocks), and bones rather fine	1
26.	Hind-legs, squarely placed, and not too near together when viewed from behind	1
27.	Hind-legs, not to cross in walking	1
28.	Hoofs, small	1

	Article.	Points.
29.	Growth	1
30.	General appearance	1
31.	Condition	1
	Perfection	31

No prize shall be awarded to bulls having less than twenty-five points. Bulls having obtained twenty-three points shall be allowed to be branded, but cannot take a prize.

SCALE OF POINTS.

COWS AND HEIFERS.

	Article.	Points.
1.	Head, small, fine, and tapering	1
2.	Cheek, small	1
3.	Throat, clean	1
4.	Muzzle, fine, and encircled by a light color	1
5.	Nostrils, high and open	1
6.	Horns, smooth, crumpled, not too thick at the base, and tapering	1
7.	Ears, small and thin	1
8.	Ears, of a deep orange color within	1
9.	Eye, full and placid	1
10.	Neck, straight, fine, and placed lightly on the shoulders	1
11.	Chest, broad and deep	1
12.	Barrel, hooped, broad, and deep	1
13.	Well-ribbed home, having but little space between the last rib and the hip	1
14.	Back, straight from the withers to the top of the hip	1
15.	Back, straight from the top of the hip to the setting-on of the tail, and the tail at right angles with the back	1
16.	Tail, fine	1
17.	Tail, hanging down to the hocks	1
18.	Hide, thin and movable, but not too loose	1
19.	Hide, covered with fine, soft hair	1
20.	Hide, of good color	1
21.	Fore-legs, short, straight, and fine	1
22.	Fore-arm, swelling, and full above the knee	1
23.	Hind quarters, from the hock to the point of the rump, long and well filled up	1
24.	Hind-legs, short and straight (below the hocks), and bones rather fine	1
25.	Hind-legs, squarely placed, not too close together when viewed from behind	1

	Article.	Points.
26.	Hind-legs, not too close in walking	1
27.	Hoofs, small	1
28.	Udder, full in form, *i. e.*, well in line with the belly	1
29.	Udder, well up behind	1
30.	Teats, large and squarely placed; behind, wide apart	1
31.	Milk-veins, very prominent	1
32.	Growth	1
33.	General appearance	1
34.	Condition	1
	Perfection	34

No prize shall be awarded to cows having less than twenty-nine points.

No prize shall be awarded to heifers having less than twenty-six points.

Cows having obtained twenty-seven points, and heifers twenty-four points, shall be allowed to be branded, but cannot take a prize.

Three points—namely, numbers twenty-eight, twenty-nine, and thirty-one—shall be deducted from the number required for perfection in heifers, as their udder and milk-veins cannot be fully developed; *a heifer will, therefore, be considered perfect at thirty-one points.*

Any one in America, where real experience with Jersey cattle is hardly more than twenty-five years old, ought to be very modest about criticising a standard set up forty years ago by the best men in Jersey, who had a lifelong experience and the much older traditions of their neighborhoods to guide them. At the same time, much attention has been given to this subject by the members of the American Jersey Cattle Club, and a tolerably full and careful discussion has occupied the attention of some of our best breeders for several years. Into this discussion the officers of the Jersey Society have now entered; and it may be in place here to refer to some of the points under consideration, and to state the reasons why a change seems desirable.

It is urged that the Jersey scale of points has the radical defect of giving the same prominence to unessential points that it does to essential ones. For instance: if a cow has her nostrils high and open, that counts one in the competition with others; if her udder is full in form—*i. e.*, well in line with the belly—that most valuable of all characteristics also counts but one. By the scale, a prize might be awarded to a cow whose teats are small, and so close as to be even grown together; whose udder is hardly apparent from behind, and is cut off in front like a goat's udder; whose hide is coarse and tight, and whose milk-veins are scarcely apparent; while one absolutely perfect in all these essential respects might be refused a premium because her muzzle is not fine and encircled by a light color; because her ears are large and coarse, her back is not straight from the withers to the top of the hip, her rump slopes, and her tail does not reach to the hocks. This objection is the most serious one, but there are other points which many think it would be better to alter.

Many of the very best cows have large, hairy ears. It is prescribed that the chest should be broad and deep. This indicates large lungs; and large lungs, beyond what is necessary for a good constitution, are considered to be one of the defects, for dairy purposes, of animals whose respiratory organs have been much developed by the vigorous breathing caused by too active exercise. It is also prescribed that the cow should be closely ribbed, having but little space between the last rib and the hip. As an element of symmetrical beauty this may be desirable; but probably an examination of the best milkers in any large herd would show them to be very loosely put together in this respect, and to have very roomy flanks. So, too, it is believed by many judges that while the hind-quarters should be long from the hock to the point of the rump, they should not be, as prescribed, well filled up, but should be extremely lean and hollow.

Since this scale of points was formed, the discovery of Guénon has come into prominence, and the escutcheon or milk-mirror is quite generally believed to be an indication of the milking qualities of the cow. While this system is not universally accepted, its adherents are very strongly of the opinion that the escutcheon should have an important place in the scale of points. The writer's own observation among cattle men in different countries has convinced him that those who attach the least importance to this indication are those who have given the least study to these details. He has never met a breeder in Jersey, in Holland, in England, or in America, who has learned to apply Guénon's instructions in full detail, who disregards it in his purchases or in his breeding.

A scale of points proposed by a member of the Club several years ago has been much considered, and has been amended from time to time. It has now been submitted to the consideration of the Jersey Society, it being desirable that they should work in concert with us in this matter. The essential features of the proposed scale are: 1. The giving to each point of excellence a number of counts proportionate to the importance of the point in judging of the cow as a dairy animal. 2. Certain minor modifications, as in the matter of the size of the chest. 3. The consideration of the escutcheon as a point of considerable merit. It is important that there should be no undue haste in the matter; but it is believed that we shall eventually arrive at a standard that will have an important influence on the future development of the race. Doubtless the American association will be careful to adopt only such a scale of points as will be acceptable to the Jersey Society; for probably we shall always receive more or less fresh blood from the island, and it is of ultimate importance that our course of breeding should conform with that adopted there.

THE QUESTION OF COLOR.

We have already seen what are the circumstances and conditions under which the Jersey cow has been brought to her present state of excellence in her native home. An influence has been exerted by the character of the recent foreign demand which has had great effect upon the course pursued by breeders in Jersey, and, consequently, upon the character of the animals they breed. In eighteen hundred and seventy-two there were no less than one thousand eight hundred and ninety-six breeding animals exported from the island; in eighteen hundred and seventy-one the number was somewhat larger. Indeed, the sale of stock to supply the foreign demand is a very large item of the farmer's in-

come, and naturally anything that is especially required by the market must be supplied by the producer.

By some process which it is difficult to understand, there has grown up, especially in England, a demand for animals of uniform color—*i. e.*, free from any white marking; high prices have been obtained in the English market for "solid" colors, black switches, and black tongues, rather than for large udders, full milk-veins, and the fine, delicate organizations that indicate large and rich milking. At the time of the formation of the American society this same fancy was beginning to take root among the breeders here; but it is believed that wiser counsels are prevailing, and that the selection of animals is now being based on more useful characteristics. The injurious effect of catering to this taste has become so apparent in Jersey that the Agricultural Society there is combating it as actively as possible, believing it to be a suicidal practice which, if persisted in, can only end in the destruction of the qualities which have given the race its chief value.

Two or three years ago, it was almost impossible to find in the whole island a young bull which had not the fashionable solid color and black points. The writer, being shown a magnificent cow with liberal patches of white upon her, and almost staggering under the weight of a large and handsome udder, asked to see her calf. He was told that it was a bull, and that as it had some white marks, and was therefore unsuited for the English demand, it had been killed. The owner of this cow afterward showed, with evident pride, a light-gray bull calf with a black switch, for which he expected to obtain a "long" price, but whose dam was a very inferior milker and the least promising as a dairy cow of the whole herd.

It is by no means asserted that the so-called "fashionable" color is in any way incompatible with the best dairy quality; but it is urged very strongly that it will never do in breeding cattle *for a given purpose*, to take as a standard any point that is not indicative of excellence for that purpose. Such a point, in breeding dairy cattle, is certainly not the color of the hair and switch, and any considerable knowledge of Jersey cattle must convince the most enthusiastic black-point man that if the selection is to be confined to animals having his favorite markings, there must be excluded a very large proportion of the finest dairy animals of the breed. Formerly a breeder showed with pride the rich yellow skin underlying the white hair upon his favorite cow, and it seems a pity that this valuable indication of high-colored butter should be lost. The question of beauty is a question of taste, and questions of taste are not to be discussed; but those of us are not few who still think that a herd of Jersey cattle is more attractive and is better constituted to make a fine show in a pasture, for being variously colored and variously accentuated with white. The argument here presented is, however, based not at all upon the question of taste, but entirely upon the more practical one of the amount of butter to be yielded by the cow. It is firmly believed that the road to the greatest possible excellence in this respect lies through a selection which shall have its range over the whole breed, and shall not be confined to such specimens as are of a particular coloring.

In the essay published in the first volume of the Club's "Register," it is stated that in the island *Herd Book* there were entries of one hundred and twenty-four bulls and four hundred and seventy-four cows; forty-one of the bulls and one hundred and six of the cows being "highly commended." Of these one hundred and forty-seven animals, only

twenty-four are said to have black switches, and only one to have a black tongue; only forty-five are of solid color, or nearly so. These indications, as well as the other markings, such as white switches or white patches, are not considered as points of excellence, but obviously only as distinguishing marks.

Even at that time no especial importance was attached in Jersey to the question of color, which is, without doubt, a dealer's question. It is no slight matter to teach a novice what constitutes a good cow, nor, after he is taught, is it always easy to supply his requirements. It is easy to tell him (as he has been told) that solid color is the "correct thing;" that a black switch has an elegant look; and that a bull with a black tongue is more likely to perpetuate the leading merits of his race than is one with a white one; and having adopted this as his standard, he becomes capital game for the dealers, for the market at St. Heliers furnishes a good supply of semi worthless brutes having the desired color, and purchasable at very low prices—not, let me again insist, that all or a very large proportion of the solid-colored animals are worthless brutes; but that if a Jersey farmer happens to have one of these which is worthless, he knows that he will find a ready demand for it at the Saturday market in St. Heliers.

A farmer in Jersey being asked his opinion on this subject, said: "My experience is that the light-colored cows are apt to be the best, and I always keep two with plenty of white about them for the dairy, and two without any white to sell calves from."

This question of color has been much harped upon during the past three or four years, and its extended treatment here has been at the risk of tiring the reader; but it seems a question of such vital importance, and, unless rightly decided, to forebode such disaster to our future breeding, that its consideration could not properly be avoided.

FORM.

Another matter of no little importance in connection with the influence of the foreign demand on the breeding in the Island of Jersey, is that of form, and here the American market has practically no influence; the great sale is to England, and the standard there set up seems to be entirely based upon the desire to take prizes at agricultural shows. England, with all its virtues and all its charms, has the great defect of seeing merit too often in mere size. The great, hulking, Short-horn steer, fattened to a disgusting degree of grossness, is England's *beau ideal* of the bovine race, and the Short-horn standard is that which seems to fill the eye of the whole agricultural community. The almost universal criticism of the Jerseys has been that they were lean, scrawny, and misshapen; and what are called the successful breeders—*i. e.*, those whose Jerseys carry off the decorations—endeavor to catch the eye of the judges by molding their cattle as nearly as possible to the Short-horn shape. Judging from the descriptions given of the prize-takers during the past few years, they must have been more like miniature Short-horns than anything we know as butter-yielding Jerseys.

In the *Country Gentleman* of February twelfth, eighteen hundred and seventy-four, there is a communication from C. L. Sharpless, detailing his observations in England in the Summer of eighteen hundred and seventy-three. From this I make the following extracts:

"The ambition among exhibitors in England is to secure an animal of solid dark color, one that will lead out stylish; the mirror is overlooked, and the qualities of the dam not regarded; but the animal must have no white, any of which color being on a bull calf consigns him to the butcher." "Among all the stock of Jersey bulls in England, I did not find one with any mirror whatever, and this because that feature is not required by the judges at the shows." An exception is made of the herd of Mr. MacDonald, at Liphook: "It contained sixty-nine milking cows—thirty-four in one field and thirty-five in another—all Jerseys, and some of them very choice. * * * They appear to have been selected for yield, and are not 'solid color with black points.'"

"Besides the fact that the Jersey bulls of England are of solid dark color and deficient in mirror, they are all beefy, and, though they lead out well at a show and get prizes, their daughters will count but little at the pail. The same applies to many of the cows, and there seems to be an instinctive yearning after the Short-horn type. Those in this country that have the same craving can be suited with the Swiss cows, and especially with a herd of thirty or forty near the top of the Righi Mountain. These are handsome, large animals, stout, and solid colors, mouse colors, duns, drabs, all with black points, and with the exact features of the Jersey—a white fillet encircling the nose."

"Besides those above enumerated, the Fowlers, of Watford and Little Bushy, have constantly on hand a lot fresh from the island, and there are scattering smaller herds; but the conclusion I came to was that, with the exception of a few choice cows in MacDonald's herd, the stock of America would not be improved by importation from England."

If anything seems certain, it is that a cow which has a tendency to lay up fat in the carcass cannot have an equal tendency to secrete fat in the udder. The only reason which can justify us in breeding Jersey cattle with care is that we believe it to be for our advantage to perpetuate, and to improve upon the special characteristics for which Jerseys are noted. These are emphatically not the beef-making tendency, but the disposition to produce a good flow of highly-colored rich milk for the practical work of our dairies and for the supply of our tables; and (subordinate to this, but also important), the peculiar delicacy, beauty, and docility of the breed. If we seek these qualities, and seek to secure their improvement, we are working in the right direction and with the right material. If, on the other hand, solid colors and black switches and well-rounded beefy forms are our aims, we had better avoid the Jerseys altogether, and apply our efforts to the beautiful cattle of Switzerland and Northern Italy.

If we undertake to produce a race of solid-colored and black-pointed animals which shall also be enormous butter yielders, we set ourselves a task of the most difficult character; if we aspire also to combine with these characteristics the rounded form of the beef-making animal, the difficulty rises to an impossibility, for the best milking quality is entirely incompatible with the disposition to make beef.

We cannot, perhaps, do much to check the tendency developed among breeders in England; but by adhering to the more prudent course in our own importations, we may, perhaps, do much to counteract the hurtful influence exerted on the island supply by the English demand.

THE QUESTION OF SIZE.

Concerning the question of color enough has already been said; but opinions vary very much on the question of size, too much prominence being often given to the supposed advantage of mere largeness—an advantage which becomes real when we are breeding for the butcher; but which may well be questioned in considering dairy results only. This subject is thus treated in the essay printed with the first volume of the Club's "Register:"

"The question of size is doubtless of great importance, but there is no positive knowledge to guide our decision concerning it; at least, I am aware of no experiments that do more than to indicate which is the wisest course to pursue. So far as uncertain indications are to be relied on at all, they seem to point to medium size as the most desirable. Further experiments as to the advantage or disadvantage of large size are needed. Certain arguments in favor of the smaller size are worthy of consideration. In the case of pure breeding, where calves have a high value, more calves will be produced with the consumption of a given amount of food in the case of small cows than of large ones; that is, a larger number of cows can be kept. In a large herd of small animals it is easier to keep up, throughout the year, a uniform supply of milk and its products, than where there are fewer animals of a larger size consuming the same amount of food. One great source of the demand for Jersey cattle is the necessity for a few quarts of milk regularly supplied for family use. A large Ayrshire or Dutch cow, giving four thousand quarts of milk during the year, will produce an oversupply during one season and go entirely dry at another. She will consume as much food as would support two little Jerseys giving each two thousand quarts of milk, one coming in the Spring and one in the Autumn. In, perhaps, a majority of instances, accommodation can be furnished for only one cow and food for only a small one. For such cases the smaller Jerseys are especially adapted, such as will give ten quarts of milk at their flush, and not fall below three quarts within six weeks of the next calving; the cream increasing in proportion, and becoming richer as the quantity of milk decreases, thus maintaining a satisfactory quantity for at least ten months of the year, and yielding enough for necessary use during the eleventh."

Dr. Voelcker, in his assay on milk, says:

"As a general rule, small races, or small individuals of the larger races, give the richest milk from the same kind of food. Whether it is more profitable to keep small or large-sized breeds is another question, of which we shall presently speak. Where good quality is the main object, Alderneys, perhaps, will give most satisfaction, for they give a richer cream than any other breed in common use in this country. The small Kerry and the miniature Bretons also produce extremely rich milk; but, of course, in much less quantity than the larger breeds."

THE INTRODUCTION OF JERSEYS INTO AMERICA.

In eighteen hundred and seventeen, Mr. Richard Morris, of Philadelphia, describes a "cow of the Alderney breed" imported a short time

previously by Mr. Wurts. He speaks of her being fed in the usual way on potatoes, and as yielding eight pounds of butter per week; also, as being small, and as being supported with less food than ordinary stock. This cow subsequently came into the possession of Mr. Reuben Haines. In eighteen hundred and eighteen, being then four years old, she gave an average of fourteen quarts of milk per day, yielding per week ten quarts of cream and over eight pounds of butter of a rich and highly-colored quality. It is not known from which of the islands this animal came.

In eighteen hundred and forty, an importation was made by Nicholas Biddle from the Island of Guernsey. These where fine animals, and their descendants, still owned by Mr. Biddle's family, are highly prized.

The importations made about the year eighteen hundred and fifty, by Mr. Motley, for himself and others, and by Messrs. Taintor, Norton, and Buck, near Hartford, may be considered the foundation stock out of which the present race of Jerseys in America has grown. Numerous importations have been made almost constantly since then, but nearly all pedigrees of ten years' standing trace back to animals imported by Motley and Taintor and their associates—a circumstance which is, on the whole, fortunate; for the average quality of animals brought into the country since eighteen hundred and sixty has certainly not been higher than the average of these earlier importations.

THE JERSEY AS A DAIRY COW.

The primary object in breeding the Jersey cow is, as in the case of all other dairy races, to secure a good cow—that is, a good milk-giver; and the first point to be regarded is to see that those characteristics which in all cows indicate large milk-giving capacities are permanently preserved, and those which denote a tendency to the production of fat in the carcass and the production of beef—that is, the grazing quality—be avoided.

It may be taken as an axiom applicable to all cows, especially during the first three or four years of their lives, that a tendency to beefiness is objectionable where the highest yield of dairy products is desired. In all works on cattle we find general directions for the selection of milking cows, which do not vary materially, and the leading principles of which should always be borne in mind. The description given in "Flint's Milch Cows and Dairy Farming" is in the main as applicable to Jerseys as to any other race, and the reader is referred to this well known work.

We may well criticise the description there given, however, in some of its points, not only in considering the Jersey cow, but equally in examining other breeds. Small short horns are prettier than long horns; but, in every race, many of the best dairy animals have horns which, while not coarse, and while of excellent color, are long and rather wild-growing. Among Jerseys, especially, many of the best animals have horns nearly black, and the quality of "glistening" is generally the result of accidental or intentional friction. That the neck should thicken as it approaches the shoulder is a statement that should be taken with some conditions. All necks do so thicken, and probably the less prominent this characteristic, the better the animal; it is too often the beginning of beefiness. Precisely what is meant by "well-formed across the hip and in the rump" should be explained. As a matter of symmetry, a straight rump and evenly-made hips are very desirable; but some

goose-rumped cows, with very ragged hips, are most excellent milkers. The prominence given by Mr. Flint to the veins of the perineum accords with the practice in Jersey, where a great point is made of the size and knotted character of these vessels, when developed by arresting their circulation by pressure.

There are some minor points of an empirical character which may or may not be of value, but which some practical dairymen rarely disregard. One of these is that the curtain or fold of skin below the flank should extend well down over the udder, and that the recess between it and the udder should be deep, this skin being also very soft and flexible. Another is that the skin on the belly immediately in front of the udder should be loose, soft, and easily drawn into deep folds. These are, after all, only indications of that general looseness of the hide which seems to belong to the more productive milkers of all breeds.

It would be out of place in an essay so limited as this to enter into a detailed discussion as to the value of the escutcheon, or milk-mirror, or to give directions for applying the system in practice. It is enough to say, generally, that, whatever its shape, the escutcheon should be large. In some cases it reaches quite up to and beyond the vulva, without much width below; and in others, without rising scarcely at all above the udder, it spreads out widely, like an apron, over the thighs. Probably in some cases, in which its development, as viewed from the rear, may seem somewhat restricted, it has a sufficient extent on the belly in front of the udder to compensate for this defect. The ideal escutcheon towards which we should all breed, should wander well out over the thighs, and reach in a broad band quite to the setting on of the tail, its outline being uniform and well defined. Whatever may be the reader's opinion as to the value of the escutcheon, surely no one would pretend that such an escutcheon as this could be in any way detrimental, nor has the writer ever seen such an one on a cow which did not perform well at the pail. There is less justification for what has been written on the subject (though it is quite likely to be true) to prove that the quirl separating the hair of the fore part of the bag from that of the belly should be as far forward as possible.

It is impossible to give in writing such a description of a perfect Jersey cow as will enable an inexperienced person to select with judgment. The knowledge required comes only with experience, and experience produces its best result only in the case of one who has a natural aptitude for observing the characteristics of animals; but there is an air of kindness, docility, generous feeding, and generous milking in the best Jersey cows which, when once recognized, can never be overlooked or mistaken, and which the skillful breeder will soon fix in his mind as the type towards which his efforts should be aimed, and the point from which (these having succeeded) his attempt at improvement should take its departure.

THE MILK OF THE JERSEYS.

It is very well understood by all who have given attention to this race of cattle, that, while the milk is somewhat less copious than that of other races, it is much richer in cream than that of any other with which we are familiar; that the cream has a higher color, and that its butter has the advantage of coming more quickly and of being more easily worked, and of being extremely firm and wax-like in its texture. In appearance it is everything that can be desired, and it is as amenable as

any other to the influence of delicate flavors in the food—it is, in fact, the *ne plus ultra* of butter.

Scientifically, there is not very much known concerning it. So far as the writer is aware, this interesting field is thus far mainly unexplored.

DR. STURTEVANT'S EXPERIMENTS.

In the Report of the Secretary of the Massachusetts Board of Agriculture for eighteen hundred and seventy-three, there is published a paper, prepared by Dr. E. L. Sturtevant, of Framingham, Massachusetts, entitled "Milk: Some Considerations Concerning its Morphology." From this paper I make the following quotations, taking only such as refer especially to the milk of Jersey cows, but omitting nothing which materially modifies the conclusions one would draw from the whole. This quotation does less than justice to Dr. Sturtevant (who is an advocate of the Ayrshires), but it is believed that had he been writing only for the purposes of this essay, he would have included nothing that is here omitted:

"Those features of animal form that are readily cognizable are usually more changed by the breeder's art than other features which are not so readily noted. Consequently, the grazing breeds have been brought to a greater uniformity and perfection than have the dairy breeds, as the changes to be desired have been more clearly indicated in the beginning and recognized in the achievement. Changes in the dairy breeds are to be understandingly brought about by breeders and farmers who have a practical belief in the universality of law—that inheritance of form is not more important in modifying the shape of the body than it is in determining the products from the animal.

"Whether a cow's milk is better fitted for the making of butter or cheese, or for any other purpose, is largely determined by inheritance, as is also the amount she will give, the manner in which she will give it, the economy with which she will produce it from her food, and the effect of the production upon the health of the animal.

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"Milk is one of the products of the animal body which possesses a form. It is composed of myriads of minute globules of mixed fats, inclosed each in an enveloping substance, which not only preserves the form, but protects the contents from the action of ether. These globules float at will in a colorless fluid composed of sugar of milk, caseine, etc., in solution. These globules, by their structure, give to the combined fluid a physical quality, as distinct from chemical quality.

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"As the shapes of animals have been modified to suit human needs or fancy, through the taking advantage of those laws controlling form, we should likewise expect that these globules, either knowingly or unwittingly, would participate in changes, and would bear a relation to the wants or requirements of the breeder.

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"The globules in milk are of varying sizes, some so small as to appear as granules under a magnifying power of eight hundred diameters; others very much larger. The small globules—for an increased power has invariably defined them as such—I shall for convenience term granules. As $\frac{1}{27000}$ inch is, with my micrometer, a convenient division,

I shall speak of all globules less than this figure as granules, and all above as globules. Every sample of milk I have yet examined has shown these granules, yet in some milks much more abundant than in others. In the skim-milk the granule has always been readily found, even when rare in the cream. These globules, being composed of various fats surrounded by a pellicle, are intimately mixed with the milk as it comes from the cow, but their position soon becomes changed as they come under the influence of gravity; they rise to the surface of the milk to form cream.

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"Having established the fact that the size of the globule determines some of the reactions in the churn, we will consider the effect of churning milk containing globules of widely different sizes. Whenever such trials have been made, and the results carefully noted, I have found that the larger globules become divested of the covering first, and oftentimes, being overchurned, hinder the same process from going on with the same facility for the breaking of the smaller globules. The overchurning of the butter destroys the grain, or the natural form in which the butter is contained in its investing coating, and, releasing the oleine, furnishes to the fluid, in emulsion, this oil, which decreases the friction to which the globules are subjected in order to produce butter. The product is, therefore, theoretically retarded and diminished.

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"The milk of the Jersey cow contains a larger globule than does the corresponding milks of the other breeds we are considering. The granules, if present, are but few in number.

"The milk of the Ayrshire cow furnishes a globule intermediate in size between the Jersey and the Dutch. The prominent feature of this milk is the numerous granules.

"The Dutch milk showed a globule smaller than in the other breeds. The presence of granules is not a prominent feature, although there were more present than in the corresponding Jersey milk.

"The properties of the globules also show some breed variations. The envelope to the Jersey globule seems weaker than the corresponding envelope in the other breeds, and more readily broken. This covering in the Jersey milk-globule is also more readily acted upon by the chemical changes induced in the milk by time. When the old cream of these breeds is examined microscopically, it is found that the Jersey globule is more readily broken or distorted by pressure than the others. Practically, therefore, this milk should be skimmed at an earlier period of the souring change than should the other milks. I am certain, from impressions gained from my own experiments, that the Jersey milk should be skimmed certainly not later than when the milk commences to thicken or "lobber" at the bottom of the pan, while the Ayrshire milk should pass considerably beyond this point, and develop somewhat more acidity before the cream is removed.

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"It will be also found that the cream which rises from the milk of these three breeds will not mix again with the milk with the same facility.

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"The milk of the three breeds was placed in a bottle and the cream allowed to rise, the bottle being corked to prevent evaporation from the

surface. By shaking the bottle it was found that the Dutch cream mixed again with the milk with the greatest facility, the Ayrshire cream less readily, and the Jersey cream with difficulty.

"It is thus seen that the form of milk, which undeniably occurs through inheritance—for otherwise it would not be as constant for breeds—is important to the uses to which it is applied, and that these considerations have a practical importance.

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"The milk of the Jersey cow, from the greater size of the globule and the character of its covering, churns more quickly than does the Ayrshire or Dutch milks. The cream also rises more completely than does the Ayrshire cream, and leaves a bluer skim-milk. The size of the globule affects favorably (apparently) the grain of the butter, and we accordingly find a different texture in the butter—a difference dependent on breed; that is, inherited. This butter is usually, perhaps always, colored by an orange pigment, which seems characteristic. Owing to this orange tinge of the fats, and the character of the substance investing the globule, the Jersey cream oftentimes appears yellow, especially after standing. This peculiarity of color to the cream is not confined to the Jersey breed, but seems to be more usually present or more prominent in this breed than in the others.

"When Jersey butter is shaken in boiling water, and the nitrogenous matter inclosed washed out and collected, it is found to be much larger in quantity than in Ayrshire butter, and of a somewhat more flocculent character.

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"Two samples of milk were selected, which showed considerable variation in the size of the globule. Twenty fluid ounces of the Jersey milk were divided into two parts, as well as twenty fluid ounces of Ayrshire milk:

"Average size of globules, Jersey milk..... $\frac{1}{52\frac{1}{52}}$ of an inch.
"Average size of globules, Ayrshire milk..... $\frac{1}{7080}$ of an inch.

"These milks were then cooled to sixty degrees and churned by shaking in a Florence flask.

"Ten ounces Jersey milk.—Butter came in five minutes; churned eighteen minutes. Product, one hundred and thirty-six grains of butter.

"Ten ounces Ayrshire milk.—Butter came in twenty minutes; churned thirty minutes. Product, seventy-six grains of butter.

"The twenty ounces of milk churned separately produced two hundred and twelve grains of butter, or a proportion of one pound of butter to 44.75 pounds of milk.

"Ten ounces of Jersey milk plus ten ounces of Ayrshire milk, mixed and churned in same manner.—Butter came in thirteen minutes; churned twenty minutes. Product, one hundred and seventy-nine grains of butter,* or a proportion of one pound of butter to 48.88 pounds of milk.

"Difference in gain of churning each milk separately, thirty-three grains, or 4.13 pounds in the proportion.

"This is a result which might have been anticipated from the considerations which have been developed from our previous experiments; for

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* "I would note that the buttermilk was churned ten minutes longer in this experiment, without producing any change in the result."

typal relations in milk have reference to a difference in size and structure, and equal forces acting on dissimilar materials could not be expected to produce uniformity in result.

"These experiments, it will be understood, are mostly comparative—that is, carried out under similar circumstances—and, however results may be modified by further study, are true *as far as they go.* It will be also borne in mind that in speaking of breeds reference is had to the type of each breed, and not to the exceptional cow, which may depart in one or more ways from the type of her nearer ancestry."

JERSEYS AS BUTTER-MAKING COWS.

Foremost among the records of large butter production, stands that of Mr. Motley's old cow Flora, published at length in the essay printed with the first volume of the "Herd Register," to which the reader is referred for details.

This cow, after dropping her third calf, made, on ordinary keep, five hundred and eleven pounds and two ounces of butter in a year. Her largest yield for one week was fourteen pounds; her smallest, six pounds."

We have some other equally reliable records concerning whole herds. In the *American Agriculturist* for January, eighteen hundred and seventy-three, there is published a statement from Mr. J. Milton Mackie, of Great Barrington, Massachusetts:

"My milking herd for the week ending Sunday, October thirteenth, consisted of thirteen cows and heifers. Seven of the cows were from four to ten years old; three were three years old; three were two years old. Four of the cows and one of the heifers had calved in September; one of the cows is to calve December fourteenth, and two others are nearly dry. Total milk during seven days, one thousand six hundred and thirty-one pounds; average weekly yield of milk per cow, seventeen and twelve thirteenths pounds. Total butter during seven days, eighty-nine and one half pounds; average weekly yield of butter per cow, about six and seven eighths pounds. About eighteen and one fourth pounds of milk have made one pound of butter. Cows at pasture, with no feed but grass. Milk set in shallow pans."

In September of the same year he reported making in the month of June, four hundred and twenty-two pounds of butter from fourteen cows, "being an average of one pound per day for the whole herd, not all the cows being in fresh milk."

In May, eighteen hundred and seventy-four, Mr. Mackie communicated the following to the *Country Gentleman* (page 327):

"My milking herd from April first, eighteen hundred and seventy-three, to April first, eighteen hundred and seventy-four, consisted of eighteen cows and heifers; considering all under three years of age as half cows, the number of cows would be reduced to fourteen and one half. Deducting also one cow for milk and cream consumed in my family, as well as that used in the farm-house, the number of cows making butter was thirteen and one half. The amount of butter actually made by them (not estimated) was three thousand eight hundred and one pounds. This is a fraction over two hundred and eighty-one pounds per cow. If I were to add to the amount of butter actually made

the quantity which might have been made from the milk consumed by the calves of the herd, the butter rate per cow would be much higher.

"It is proper to add that my herd is kept mainly for breeding, and only secondarily for the butter product. My cows get only grass in the season of it, supplemented by corn fodder; during the rest of the year they are fed English hay, a very small quantity of sugar beets, and two quarts of corn meal daily per cow. This regimen keeps the herd in good breeding condition, and enables each cow to make one hundred and sixty-eight dollars worth of butter per annum. The earnings per cow would probably be considerably higher if my farm were near a good market, instead of being situated in the Berkshire hills."

In the Ogden Farm Paper, number thirty-three (*American Agriculturist*, October, eighteen hundred and seventy-two), there appears the following statement concerning the production of the Newport herd:

"During the week ending August tenth, we were milking thirty animals. Of these six had aborted at from four to seven months, and were giving very little milk. (Three of these had previously been the very best milkers in the herd, and had now become almost the worst.) Eleven were two-year-old heifers with their first calves, six were three-year-olds with their second calves, and one was very nearly dry. They are, therefore, far from being an "able-bodied" herd, nor are they heavy feeders. Yet they made during this week one hundred and fifty-three pounds of butter, worth, at ninety cents per pound, one hundred and thirty-seven dollars and seventy cents. It was about the hottest and most unfavorable week I ever knew.

"One fact developed by the record of this week may surprise those who are not familiar with the Jersey breed. The average weekly yield of butter was (per cow) five and ten one hundredths pounds. The average daily yield of milk was thirteen and twenty-one one hundredths pounds. The *largest* daily yield from a single cow was twenty-three and seventy-eight one hundredths pounds. The total yield for the week was two thousand seven hundred and seventy-four pounds, and the weight of milk required to make a pound of butter (averaging the whole herd), was eighteen and thirteen one hundredths pounds, or eight and forty-three one hundredths quarts. This is not by guess nor by 'rule of thumb,' but by actual weight taken at each milking, the cows being on green Summer feed. The product has since fallen off somewhat, as an effect of the hot, close August weather, but the reduction has been more in the amount of milk than in the yield of butter.

"The record would not be complete without an account of our manner of feeding, etc. The cows pass the night in the barnyard. In the morning they receive an average of three quarts of wheat bran and a good feed of corn fodder. They then go to pasture, where they remain, on good feed, until four P. M. Then they are brought in, and have all they can eat of corn fodder.

"TABLE OF AGES AND CONDITION.

Animal.	Age.	Condition.
Rene 2d	8 years...	Very fine, but aborted in 1872.
Romp	7 years...	First-class in all respects.
Flora	5 years...	Of moderate size, but an ordinarily good cow. Has lost the use of one teat.
Renella	5 years...	Extra good, but aborted in 1872.
Margery	5 years...	Extra good; aborted January 6th, 1872.
Omoo	8 years...	Excellent in all respects.
Xyrida	6 years...	Excellent in all respects.
Fancita	4 years...	Excellent; aborted in 1872 with very young calf.
Mirth	4 years...	Small, but good of her size; aborted in March (and was removed.)
Nora	4 years...	Fair size and good.
Goldstraw 2d	4 years...	Large, and a fine milker.
Flora Hinman	4 years...	Very small; never goes dry.
Rhoda	4 years...	Equal to her dam, Romp.
Calliope	4 years...	All right in every way, and of fair size.
Flora Ogden	3 years...	Good, but aborted in 1873, from injury.
Rene Ogden	3 years...	Extra good; aborted early in 1872; purposely dried three months before calving, as she was in low condition.
Fantine	3 years...	First-rate.
Pet Margery	3 years...	Good, and in good condition.
Evangeline	2 years...	Large and promising; first calf.
Noreina	2 years...	Moderate size; first calf.
Oonan	2 years...	Was a July calf, and is small.
Audrey	2 years...	Growing rapidly, but milking fair for a heifer.
Enid	2 years...	Of good size, and very good indeed.
Elaine	2 years...	Aborted her first calf in 1872.
Anna Roxbury	2 years...	Very small, but very good and rich.
Thrift	5 years...	Inclined to fatten, and killed in consequence.
Daisy	6 years...	Good in all respects.
Luck Lass	2 years...	A rich milker for size and age.
Virgie	3 years...	A September calf, but a very fair milker for her age.
	1873.	
Belle Ogden	3 years...	As large as a "native."

"I think they would do better if 'soiled' entirely with suitable fodder; but I have pasture land which must be used in this way, if at all, and the high price of Winter forage tempts me to cure all I can of the soiling crops."

In number forty-nine of the same series (March, eighteen hundred and seventy-four,) there is a complete digest of the production of the whole herd for the whole year.

"The record of milk produced begins on January fifth (the first Sunday), eighteen hundred and seventy-three, and ends on January third (the first Saturday), eighteen hundred and seventy-four. The regular Jersey herd consisted of the animals, of the ages and conditions stated in table above.

"In addition to these there were two Jersey cows in the herd for a few weeks, who gave together four hundred and seventy-seven pounds of milk.

"Also, nine grades and natives, which were milked an average of nineteen and two thirds weeks.

"The Jerseys named above appear and disappear on the milking list, as shown in the following table. Some had been dry for some time, owing to accidental causes, and some came in with their first calves:

Animals.	Date of previous calving.	Calving in 1873.	Appears on record, 1873.	Went dry.	Reappears.	Disappears finally.	Remarks.
Rene 2d	*Spring, 1872	June 30	July 7				Still milking.
Romp	April 9	May 11	January 5	March 12	May 16		Still milking.
Flora	*Early, 1872	April 25					Still milking.
Renella	*Early, 1872	No calf	January 5	May 7		May 7	
Margery	April 11	*January 6	January 6	April 19		April 19	
Omoo	October 26	No calf	January 5			November 21	Sent west.
Xyrida	February 5	May 12	January 5	March 18	May 17	November 21	Sent west.
Fancita	*Early, 1872	April 14	April 21				Still milking.
Mirth	May 5	*March	January 5	March 2	April 4	November 21	Sent west.
Nora	June 10, 1872	May 3	January 5	April 24	May 5		Still milking.
Goldstraw 2d	Dec. 20, 1872	May 18	January 5	January 16	May 25		Still milking.
Flora Hinman	Nov. 10, 1871	April 21	January 5	April 13	April 23		Still milking.
Rhoda	January 17, 1872.	April 25	January 5	March 31	April 27		Still milking.
Calliope	January 31, 1872.	May 27	January 5	April 5	June 3	November 21	Sent west.
Flora Ogden	May 11, 1872	*May 2	January 5	March 1	May 22	November 21	Sent west.
Rene Ogden	*Early in 1872	June 19	January 5	March 14	June 23		Still milking.
Fantine	May 11, 1872	April 28	January 5	March 13	May 8		Still milking.
Pet Margery	May 16, 1872	April 24	April 27			November 21	Sent west.
Evangeline	None	April 29	May 2				Still milking.
Norema	None	May 12	May 25				Still milking.
Oonan	None	May 3	May 4			November 21	Sent west.
Audrey	None	April 4	April 20				Still milking.
Enid	None	May 6	May 11				Still milking.
Elaine	None	*April 6	April 9			November 21	Sent west.
Anna Roxbury	None	May 15	May 25			November 28	Sent west.
Thrift	Not bred		January 5			June 2	Killed.
Daisy	Spring	July 10	January 5	May 24	July 15		Still milking.
Luck Lass	None	May 3	May 9				Still milking.
Virgie	None	July 2	July 6				Still milking.
Belle Ogden	No record	May 12	May 16			November 28	

* Aborted. Six of the milking animals were sent to our sale depot in Illinois, November twenty-first.

"It will be seen from this list that of the thirty Jerseys, six were three-year-old heifers with second calves, and seven were two year-olds with first calves. Nine abortions, falling largely among the better animals, seriously diminished the yield.

"The product of milk for the year was one hundred and three thousand one hundred and eighty pounds. Of this the nine grades and natives gave fifteen thousand and forty-one pounds, and the odd two Jerseys four hundred and forty-seven pounds, leaving eighty-seven thousand six hundred and ninety-two pounds for the Jerseys. Counting the whole thirty as cows, and as being in the herd for the whole year, the product would be two thousand nine hundred and twenty-three pounds each. But it was far from being a herd of thirty cows. Of Renella, Margery, and Thrift, we had only the fag end of their unfavorable milking of the previous year. They were entirely absent eight, nine, and seven months—equal to an absence of two cows for one year. Those sent to Illinois, being deducted, equal an absence of one cow one year. The seven two-year-old heifers and the nine aborting animals would be liberally treated if we were to count them as equal to half as many cows, or deduct eight for them for the whole year.

"These deductions will bring the herd of the year to nineteen average cows, yielding an average of four thousand six hundred and fifteen pounds, or, calling two and fifteen one hundredths pounds a quart, to an average of two thousand one hundred and forty-six quarts."

A large quantity of milk was purchased from neighbors, which by a careful estimate was found to have made during the whole year, one thousand two hundred and eighty-five pounds of butter. The result is estimated as follows: "The whole amount of butter made, including what was consumed on the farm during the year, was five thousand nine hundred and twelve pounds. Deducting for the purchased milk one thousand two hundred and eighty-five pounds, leaves four thousand six hundred and twenty-seven pounds for our own herd. Of this, taking out for the fifteen thousand four hundred and ninety-four pounds of milk (of the nine natives and two odd Jerseys), equal to seven thousand two hundred and six quarts, yielding, at twelve quarts to the pound, six hundred pounds of butter, four thousand and twenty-seven pounds are to be credited to the regular list given above. Dividing this by nineteen, we have a yearly average of two hundred and twelve pounds per cow."

In another of the Ogden Farm Papers the writer says:

"As a perfectly fair specimen of the smaller type of the herd, I will instance the case of Flora Hinman, a thoroughbred, which weighs now—after dropping her second calf, and when she is three years and four months old—six hundred and three pounds. Her first calf was dropped November tenth, eighteen hundred and seventy-one, when she was twenty-three months old. The milk did not go into the dairy until December third. From that time we carefully weighed all her milk until April thirteenth, eighteen hundred and seventy-three, when she was dried off preparatory to her second calving (April twenty-third.) I divided her reckoning into eighteen periods of four weeks each. It stands as follows: first—five hundred and one half pounds; second—four hundred and nineteen pounds; third—three hundred and forty-six and one half pounds; fourth—three hundred and sixty-one and one half pounds; fifth—three hundred and eighty-nine and one half pounds; sixth—three hundred

and thirty-one pounds; seventh—three hundred and nine pounds; eighth—three hundred and thirty and one half pounds; ninth—three hundred and forty four and one half pounds; tenth—three hundred and six pounds; eleventh—two hundred and sixty-five and one half pounds; twelfth—two hundred and thirty-three and one half pounds; thirteenth—one hundred and eighty-four and one half pounds; fourteenth—two hundred and nine and one half pounds; fifteenth—one hundred and seventy pounds; sixteenth—one hundred and eighty-one pounds; seventeenth—two hundred and sixteen and one half pounds; eighteenth—eighty-nine pounds. Total in seventy-two weeks—five thousand one hundred and seventy-seven and one half pounds. This is over eight and one half times her own weight at the end of the period, and probably over ten times her weight at its commencement. Taking two and fifteen one hundredths pounds milk as equal to a quart, she gave two thousand four hundred and eight quarts. I am confident that for the average of her milking period, two Winters and one Summer, fifteen pounds of her milk would make a pound of butter, and that she actually produced between her two calvings three hundred and forty-five pounds of butter. To apply a more severe test, we will take her yield during the year before her second calving, beginning April twenty-second, eighteen hundred and seventy-two. Her yield was three thousand one hundred and sixty pounds of milk, or (by the above computation) two hundred and ten and two thirds pounds of butter. She had no extra care, and was never in high condition."

The late Andrew Robeson had a small herd of unusually good quality. His experiments concerning them were communicated to the *American Agriculturist* (June, eighteen hundred and seventy-three), in the following tabular statements:

Animals.	Age.	Weight, April 23, 1873.
Locket	5 years.	805 lbs.
Gala	5 years.	820 lbs.
Rosemary	4 years.	790 lbs.
Zoe Le Bas	4 years.	830 lbs.
Silver Gray	7 years.	740 lbs.
Alice	8 years.	910 lbs.
Zillah	4 years.	760 lbs.
Cannie	5 years.	1,050 lbs.

NOTE.—Rosemary, Zillah, and Cannie are heavy with calf.

Name.	Date of beginning record.	Number of days in milk.....	Total milk in pounds.....	Daily average in pounds.....	Average percentage of cream....
Locket	April 10, 1872	265	5,065½	19 11/100	19.20
Gala	Feb. 12, 1872	370	7,580½	20 48/100	16.87
Rosemary	April 12, 1872	252	3,069½	12 18/100	19.65
Zoe Le Bas	April 23, 1872	304	4,760	15 65/100	16.40
Silver Gray	May 2, 1872	303	6,054½	19 98/100	15.37
Alice	May 2, 1872	300	6,706½	22 35/100	16.52
Zillah	June 11, 1872	262	6,122½	23 57/100	11.49
Cannie	July 9, 1872	266	5,169	19 43/100	17.62
Average of all...	.....	290	5,566	19 9/100	16.64

An experiment was made by Mr. Chas. M. Beach with three pure Jerseys, three grades, and three natives, the experiment being carefully conducted for a week. The animals were in the same condition and kept on the same food. Each lot averaged about the same time from calving. Six and one half quarts of Jersey milk made a pound of butter; of the milk of the grades there were required eight and one quarter quarts, and of the natives eleven quarts; so that a Jersey cow giving twelve and two thirds quarts, or a grade giving sixteen and one half quarts, would make as much butter as a native cow giving twenty-two quarts.

A curious experiment was recently made by General W. S. Tilton, at the National Soldiers' Home, near Augusta, Me. The herd consists of Dutch cattle, grades, and Jerseys. The average of milk per day for the whole year, as compared with the average weight of the cows of each class, was:

Dutch ..... 1 56/100 per cent of live weight.
Grades ..... 1 14/100 per cent of live weight.
Jerseys ..... 1 28/100 per cent of live weight.

The proportion of cream was as follows:

Of Dutch it took 3 2/100 pounds live weight to produce one quart.
Of Grades it took 3 88/100 pounds live weight to produce one quart.
Of Jerseys it took 2 29/100 pounds live weight to produce one quart.

So that if an animal (other things being equal) consumes food in proportion to its weight, then in order to make as much cream from the other breeds as can be made by a Jersey consuming two thousand pounds of hay, we must feed a Dutch cow two thousand six hundred and forty-nine pounds, or a grade two thousand four hundred and two pounds. As the cream of Jersey milk produces more butter per quart than that from the other sorts of cattle, the advantage in butter making is still more in favor of the Jerseys.

Mr. M. Y. Tilden, of New Lebanon, N. Y., contributes to the *Country Gentleman* a statement of the product of his herd, placing the average annual production of butter per cow, for the year eighteen hundred and seventy-three, at three hundred and thirty-three pounds. In another statement concerning this herd by Colonel M. C. Weld, it is stated of one of the animals that she produced, from the first to the fifteenth of September, $35\frac{11}{16}$ pounds of solid packed butter.

In the *Country Gentleman* for August sixth, eighteen hundred and seventy-four, there is a communication from myself, analyzing the record of Mr. Thos. J. Hand's herd at Sing Sing, N. Y., for twelve months, showing an average of four hundred and six pounds per cow.

In nearly all of the foregoing estimates certain allowances are made for young heifers and cows out of condition; but after taking this into full consideration, the evidence is most convincing that the Jerseys are incomparably superior to any other breeds that are in general use in this country in the point of butter production.

That the quality of the butter is as superior as is its quantity need hardly be stated, the price which it bears in market being ample evidence of this fact.

And not only is the quantity greater and the quality superior, but the much greater ease with which the butter is manufactured—the shorter time required for churning, the less amount of working needed to produce the proper consistency, and the less care required in sending to market in warm weather—is of itself a strong argument in favor of the breed.

THE ADAPTATION OF JERSEYS TO DAIRY FARMING.

The facts set forth above are sufficient to demonstrate the adaptation of the Jersey cow to the needs of the dairy farm. They have been equally successful in all sections of the country, and hold their own in Maine and California, in Wisconsin and Mississippi. With considerable facilities for knowing the estimation in which they are held in the different States, the writer would be at loss to say that they are more popular, among those who are acquainted with their merits, in one part of the country than in another.

Hitherto their use has been largely confined to those who have kept them only partly, if at all, for profit; but during the past few years they have been rapidly finding their way among ordinary butter-making farmers.

The price at which pure-bred animals have sold has prevented the formation of herds of thoroughbred cows to any great extent among farmers, but it is becoming so well understood that an infusion of Jersey blood greatly improves the butter-producing quality of herds of native cows, that an active demand is arising for bulls, and in this manner herds of Jersey grades are being formed all over the land. Whatever may be the future demand for thoroughbred females, there can be no question that bulls from the better class of cows will soon be quite as sure of a ready sale, and it is unquestionable that the country is in this manner to receive a very important addition to its agricultural wealth.

THE ADAPTATION OF JERSEYS TO DOMESTIC PURPOSES.

All things considered, there is no cow equal to a good Jersey as a "family cow," especially for use on small homesteads. She is small,

docile, easily handled; is hardy, hearty, and easily kept; the long habit of the race has made her more patient of confinement than our other breeds; and a short tether on a well-grassed paddock is all that is required to maintain her in perfect health.

The quantity of milk yielded is, of course, much less than that of cows whose milk is not so rich, yet it is sufficient for the uses of an ordinary family, and its large quantity of rich and well-flavored cream gives, at little cost, a highly-prized luxury.

For use under these circumstances the small size of the cow is of decided advantage. If only one animal is kept, the economy of food, when compared with that consumed by other breeds, is important; and owing to the persistence with which the production of milk is continued with an ordinarily good Jersey cow, the family will rarely be more than from six weeks to two months without a sufficient supply of good milk.

If a larger quantity of milk is required, two little Jerseys, coming in one in the Fall, and the other in the Spring, will keep up a constant supply the whole year round, and will consume not materially more than would one hulking native, producing a uselessly large quantity of thin milk during one season, and going entirely dry for months at another.

THE ORNAMENTAL USES OF THE JERSEY.

It would be ungracious not to regard what may be called the purely "fancy" use of this breed, since it is to this that we owe so large an influence in securing its early introduction; and however desirable the Jersey may become for the farm or for the household, she is not likely to lose her preëminence as a decoration for lawn pastures. Her deer-like beauty, and aristocratic, thoroughbred air, will insure the continuance of her position as the lawn cow *par excellence*.

We were at one time in danger of some disturbance of the even course of our judicious breeding by the threatened prominence of the demand for solid-colored animals; but this is happily passing away, and it is fast becoming understood that the typical beauty of this race includes as a prominent feature its constant tendency to vary in its marking. A herd of differently colored Jersey cows, of good breeding and in good condition, may well be thought to furnish the perfection of bovine beauty with which to set off the attractions of ornamental grounds; and, indeed, the marvelous charm of the scenery of the Island of Jersey, where the vegetation of every clime grows in luxuriance, and where the ivy clothes every neglected stump and stone and every mound of earth with its abundant foliage, is emphasized and greatly increased by the beauty and varied coloring of the animals tethered in every field and orchard.

BREEDING JERSEYS IN AMERICA.

The foregoing observations cover the fundamental principles which should regulate the objects and the manner of breeding Jersey cattle in this country.

No one entering systematically into this business can afford to disregard the demand that will always exist for cattle of an ornamental character; and it is probable that for some time to come the highest prices will be obtained for individuals of excellent milking qualities, possessing the highest beauty and the most tractable and docile disposition. It is,

therefore, important, that in the selection of animals for breeding the question of appearance be never lost sight of. It is not necessary to enlarge further on the question of color, except to say that while tastes vary in this matter, and while there are still many who prefer uniform dark colors, the writer's own observation indicates that a small amount of white is more often preferred, even by those who attach the greatest importance to appearance; and that while, with a view chiefly to ornamental uses, buff noses, brindles, and a very large proportion of white—one half or more—are undesirable, attention should be paid chiefly to delicacy of form, softness of expression, especially about the eye, fineness of horn and tail, and a general thoroughbred look.

Bearing these less essential points in view, the purpose should be to secure animals of perfect quality for domestic uses or for the dairy, for both of which precisely the same characteristics are desirable.

The key to all success must lie in the selection of the bull. That he should be individually perfect is sufficiently understood, but much more than this is necessary for systematic success. The immediate qualities of the animal himself—his form, fineness, richness, delicacy, and milky look—although important, should be really a secondary consideration.

The fundamental principle of successful breeding may be thus expressed: Like produces like, *or the likeness of some ancestor.* Perhaps it should rather be said, the likeness of some *ancestors;* for the qualities transmitted are doubtless the sum of the preponderating qualities of the bull's ancestors. In looking back over the history of the family, we have two things to regard; first, the quality of the dam and the granddams for generations back; second, the character of the progeny of the ancestral bulls. This constitutes the great value of pedigree—a value that cannot be availed of, unless by the aid of the pedigree we investigate the characteristics of previous generations.

The importance of the bull lies in the fact that his progeny is greatly more numerous than that of any individual cow, and is to manifest itself in the future progeny of the whole herd. So far, however, as individual progeny is concerned, the dam is of equal value with the bull, and her goodness is more clearly manifest, because we have her udder production immediately before us for observation. It does not follow that the calf of a good cow will necessarily be itself good; if the likeness of the progeny is to herself, it will be good; but there is always strong reason to believe that the progeny will take its characteristics from the cow's dam or sire, or from some more remote ancestor, and that defects not manifest in her own case will crop out in her produce.

The history of the race in this country is too short, and records have been kept with too little care, for any considerable investigation in this direction to be made. The real improvement must begin now, when, with the aid of recorded complete pedigrees, we can trace the whole line of descent, and follow, from this time on, the characteristics of the individuals of successive generations, excluding, step by step, all inferior animals, and selecting bulls in whose blood are concentrated the virtues of unexceptionable ancestry. Or, perhaps it would be better to say that we shall be able to exclude points of defect in ancestry, eliminating from generation to generation whatever may tend to a reproduction of undesirable qualities, and so securing better and better bulls as our work goes on.

In the present state of the art we must depend chiefly on the selection of good female ancestors; but henceforth the character of the progeny of male ancestors should be taken more and more into the account, as

being at least of equal importance with the producing quality of the other sex.

Nothing seems to have been determined concerning the age at which it is best to breed from a bull. So far as dairy animals are concerned, the practice in this regard differs in different countries, and there is at least as much reason to suppose that the best result will be obtained from the use of very young bulls as from older ones. Until something more is known in this respect, bulls should be selected for their quality without much reference to age.

It is the almost universal custom in the Channel Islands to have heifers come in at about two years of age, and it is under the influence of this custom that the race has attained its present perfection. Aside from the profit of this practice (bringing the animal into use a year earlier than if she came in at three years old), it is believed that the very early exercise of the milk-producing function tends to its more complete development. Greater size would be attained if the animal were allowed another year for development, but this increase of size would perhaps be accompanied by a tendency to fleshiness or beefiness, detrimental to a concentration of the vital forces upon an active lactation.

It is therefore recommended that heifers be led to the bulls when about fifteen months old; or rather, as the full stimulation of the production of milk under the influence of the succulent herbage of Spring and early Summer is highly important in developing the young animal, that she be made to come in in May, when *about* two years of age. It is a good practice to turn the bull, about the first of August, into the pasture with all heifers not less than nine months old. This will bring them to calve usually during May or June of the following year. An objection has been suggested to this custom, for the reason that if the bull runs with the females, the exact date of their calvings cannot be foretold. This is not an important objection in the case of heifers coming in with their first calves, as the enlargement of the vulva toward the termination of the first pregnancy sufficiently foretells the event.

The value of the progeny of thoroughbred animals of all races often tempts breeders to work their cows too hard. We have not yet so far removed our cattle from the condition of nature as to make it seem prudent to require them to produce more than one calf in twelve months, and the proper development of the milking tendency is, perhaps, better effected if during the first three months after the calving there be no other demand on the vital powers.

There is much difference of opinion as to the period during which the cow should go dry before calving. It is essentially important that she should at least become entirely dry, so that the udder may be at rest during the secretion of the colostrum, which precedes the flow of the milk proper. Probably it will suffice if there be an absolutely dry period of two or three weeks; longer than six weeks is undesirable, and cows having a tendency to run dry for a much longer period, while they may be very good in other respects, should have this tendency counted against them when considered as the ancestors or progeny of bulls from which to breed.

THE TREATMENT OF CALVES.

Heifers with their first calves, unless their teats are more fully developed than the teats of young heifers are wont to be, should suckle their calves until these are well drawn out; but while suckling they should be milked dry at the regular milking times, morning and evening, the calf

working at the bag at pleasure during the rest of the twenty-four hours.

Except as above, it is better to remove the calf after twenty-four hours, allowing it the slight medicinal action of the colostrum (warm from the teat) during this time. After this it should for a week have only its mother's milk to drink, and until it is well established—say for the first fortnight—it should be fed three times a day. After this the feeding may be restricted to two meals per day, and other milk than the dam's may be substituted. When three weeks old, if healthy and sprightly, a little warmed skimmed milk may be introduced into the fresh, and the quantity of this may be increased until, at the end of six weeks, skimmed milk (always warmed) constitutes the exclusive diet. If, during this transition, the calf shows a tendency to *scouring*, the proportion of skimmed milk should be lessened, and after its return to health should be increased with great care.

Fine hay may be eaten, in small quantities, at a very early age; so may oats; but bran should never be given to calves, because of its irritating, relaxing effect on the bowels; and it is better to keep them entirely from grass till at least three months old, and, perhaps, even until their second Summer.

During the first Winter the calf should be kept chiefly, if not entirely, upon hay, in order that in satisfying its appetite it shall consume the greatest bulk of food possible, thereby extending its digestive organs (its future *laboratorium*) as fully as possible.

The question of the age of bulls is often influenced by the unruly disposition shown by mature animals. It is a common belief that Jersey bulls are especially vicious after two or three years old. The writer, with an experience of a number of mature animals, never having had one the least unruly, believes that the development of the vicious tendency is mainly the result of improper treatment. Bulls kept to themselves in dark or dimly-lighted stalls, approached but rarely, and then too often with fear, do undoubtedly become very unmanageable; but, if kept tied in the same range of stalls with the cows, constantly accustomed to the presence of man and to the visits of strangers, petted and patted and familiarly handled, they seem to remain docile to their full age. Observation of other herds, in which bulls are treated in this way, confirms this impression.

THE MANNER OF FEEDING.

There is not very much to be said concerning the feeding of the Jerseys, as distinguished from other cows. The rule applies in their case, as in all others, that the nutriment should be ample for the perfect sustenance of the animal's organization, and, *beyond this*, for the production of the largest possible yield of milk. Profit in feeding any stock is derived entirely from the excess of food beyond what is required to maintain a good condition and supply the natural wastes of the body. As stated by an experienced farmer, the proposition is thus: "If you feed six quarts, you get nothing back; if you feed nine quarts, you get back a little; if you feed twelve quarts, you get back a great deal."

The best feed, so far as the cow is concerned, though not the most economical, is a good range of luxuriant-growing pasture, in which the grasses are sweet and nutritious. Tethering leads to the more complete depasturing of the ground, and gives sufficiently good results. The use of grass for soiling is still more economical, where the relation between

the value of labor and of manure allows its adoption; it is as well for the cow as tethering, and much less wasteful of the grass. A system of complete soiling on green rye, green oats, grass, clover, and fodder corn, is to be recommended whenever the value of manure indicates that soiling would be profitable. All soiling crops may be wilted with advantage before being fed, and with fodder corn a very thorough wilting, even lying the whole day in a hot sun, is decidedly beneficial.

It is a good custom in Summer, at milking time, to give each cow a quart of bran, not so much for the nutriment it contains, as to make them glad to come to the milking stalls, and to keep them quiet while being milked. For Winter food, nothing can equal early-cut hay and well cured clover hay, and these may be profitably supplemented with oats, bran, and a very little oil meal or Indian corn meal. Indian meal should, in the case of a breeding herd, be used with caution and in limited quantity. For a "butter butcher" it has no equal. Fresh cows fed eight quarts of clear meal per day (or as much as they will eat) give very rich milk, with a good proportion of butter, and butter of a very good quality, and as they dry off are fat enough for the shambles; but in a breeding and milking race like the Jerseys, where it is especially desirable not to encourage too great a tendency to take on flesh, and where the cows should at no time be fat, even when dried off for calving, Indian meal is perhaps the most undesirable food that can be given.

Often, where herds of good Jerseys are kept, a full supply of the best hay cannot be obtained. In such cases steaming may be resorted to with decided profit and advantage; or, if good hay and inferior hay or cornstalks be cut together, and mixed with bran, ground oats, and a moderate quantity of Indian meal, the good flavor of the meal and of the better hay is diffused throughout the mass, the whole being made palatable and nutritious.

As suggested above, during the first one or two years, the Jersey calf or heifer should be fed on forage which, while sufficiently nutritious, is rather bulky than concentrated, in order that there may be developed a good capacity of the digestive organs.

Mr. Charles L. Sharpless, in a communication to the writer (June, eighteen hundred and sixty-nine), gives his views of the proper treatment of Jersey cattle, as follows:

"There is no better feed in Summer for the Jersey cow than the natural grasses of the rich old pastures, abounding in blue grass, white clover, and sweet-scented vernal. In almost every such field you find some orchard grass and red clover, which, from increasing the variety, add to the value of the pasture. As soon as the cows begin to fall off in yield, change them, if possible, to another field. If the fields can be so arranged that there will be at the rate of an acre for each cow, and there be three such fields, each of which can be pastured a week at a time, it will make an agreeable change for them. As to how many cows can be kept on a given number of acres, it may be safely laid down that if the pasture be an old one, and be kept rich by an annual top-dressing, and if there be judicious arrangements for changing, one animal may be kept to each acre. On the Island of Jersey, such is the luxuriance of the pasture, that the practice of tethering enables them to keep thriftily at the rate of two and one half animals for every acre.

"The idea that many have, that meadow pasture is the best, is a mistake. The meadow grasses lack in sweetness and in the nutritive and milk and butter qualities. There are no better pastures than those on

high land, or on hillsides facing from southeast to southwest. In either case the more perfect the drainage, the greater the yield. In turning out cows on the natural grasses, there is but little danger; but if their stomachs be empty, and they be turned on to red clover, hoven, often fatal, is pretty sure to occur.

"The practice of feeding meal or bran when at pasture is to be condemned—first, as not being economical; second, as keeping the cow in a forced condition. If fed very strong, in order to increase her yield, she may reach a point which it is impossible to keep her to, the reaction from which will leave her worthless.

"These same grasses, cut when the clover is fully ripe, before browning, make the best of Winter hay. For their Winter keep from fifteen to twenty pounds of hay is enough per day, varying according to the size of the animal. To this may be added from eight to twelve quarts of carrots per day, and eight quarts of wheat bran, and two quarts of corn meal—the bran and corn meal to be reduced as the cow's yield diminishes.

"The Jersey bull will need per day ten pounds of hay, four quarts of wheat bran, one quart of oats or of corn meal, and two quarts of carrots, with a bushel of grass twice a week in Summer.* As to water, once or twice per day in Winter, and two or three times per day in Summer, will be enough."

THE AMERICAN JERSEY CATTLE CLUB.

This essay would be incomplete without an account of the formation of the Cattle Club, and of the manner in which it has endeavored to foster pure breeding, and to extend a knowledge of, and interest in, the breed.

In eighteen hundred and sixty-eight, Messrs. Sam. J. Sharpless, Chas. M. Beach, Thos J. Hand, and the writer, after consultation as to the best course to be pursued, asked the concurrence of some of the leading breeders, and held a meeting in Philadelphia, which resulted in the organization of the Club, the adoption of the Constitution, and preparation for publishing a Herd Book. About forty breeders were constituted the original members. Since that time nearly one hundred others have been elected.

The formation of the "Herd Register" was at once undertaken, such rules being established as at that time seemed adapted to secure the admission of all animals of pure Jersey blood, and to insure the exclusion of all others. Up to this time pedigrees had been kept, when kept at all, only in the private records and desultory correspondence of importers and breeders. There were some Guernseys in the country, and it had been usual to speak of these and of Jerseys indiscriminately as "Alderney;" this confused the records very much, and added greatly to the difficulty of excluding such as were not clearly pure Jerseys, without doing injustice to owners. The preparation of the first volume of the "Register" required, for several years, the labor not only of the Secretary, but largely of the members of the Executive Committee, and of others who were familiar with the earlier importations. It is believed that the result of this work has been to exclude all animals not clearly

*Many bulls will do better on less grain; some on none at all.—ED.

of pure Jersey stock, and to admit all of those offered for entry which were, on evidence, entitled to registry.

Many breeders, doubting that the Club's "Register" would ever become an important standard, withheld their records, trusting, as before, to their own private evidences of purity of breeding. It had been determined, after the publishing of the first volume, to make the rules concerning the evidence of importation from Jersey, and of the purity of breeding, much more strict and precise than those previously in force; but breeders became gradually convinced of the importance of registry, and there were constantly presented fresh cases which seemed as worthy of attention as many that had already been admitted, and the doors were kept open still longer, that all might have an opportunity to prove the purity of their herds. After much discussion it was decided that no animal should be admitted without the most absolute evidence in every detail, unless application was made before December thirty-first, eighteen hundred and seventy-two. The number of converts to the value of the "Register" continuing to be large, this limit was extended to December thirty-first, eighteen hundred and seventy three. There had thus been given more than five years, from the time of the commencement of work on the "Register," during which breeders could have the same privilege that had been extended to those who first took advantage of the Club's movement. This limit has now been passed, and no reasonable objection can be made to the course pursued.

The "Register" had become sufficiently known, and ample opportunity had been given to all to avail themselves of its advantages. Henceforth its influence could only be weakened by a further extension of the indulgence; and since the first of January, eighteen hundred and seventy-four, the rules have been so far tightened that it is believed impossible to secure the entry of any animal concerning which there is not given such evidence as to make it absolutely certain that imported animals came from the Island of Jersey, and that animals bred in this country have had their whole history so recorded that we can know their distinguishing marks, their breeders, the exact date of their birth, their present and consecutive ownership, and the names and registry numbers of their sires and dams.

Hereafter no animal can be registered as imported from Jersey which is not proven to be of "Herd Book" stock in the Island of Jersey, and which is not identified with a photograph taken on the island; no American-bred animal can be registered which is not proven to be the offspring of animals already registered.

Admitting (which is not likely) that there is a slight infusion of Guernsey or any other blood in the earlier registrations, as every successive generation will divide the impurity, even this must soon practically disappear, and registry will be an absolutely certain evidence of practical purity.

The Club is certainly to be congratulated on the success that has attended its movements. Its registry is now the standard of pedigree in all parts of the country, and there are few agricultural societies of any importance which admit Jerseys to competition for premiums unless they are entered in the Club's "Register."

The usefulness will be much increased by the recent rule of the Executive Committee, that all applications for entry shall bear the certificate of the breeder, and that the breeder shall be recorded, either in the body of the work or the list of transfers, as the owner of the dam at the time she became pregnant with the animal offered for entry. This

involves the keeping of a record of *all* changes of ownership, which secures the complete written history of every animal appearing as a dam or sire.

The pecuniary success of the Club, though at first doubtful, has now become fully assured, and its funds are gradually increasing. This fund, however, can under no circumstances accrue to the personal benefit of any member; there is no compensation except to the Secretary (for the keeping of the records.) All moneys in the Club's treasury are to be devoted to the furtherance of the interests of the Jersey-breeding public—to be expended in premiums on cattle exhibited, for essays concerning the breed, for the publication of information, for the expenses of investigating committees, etc.

There can be no doubt that in this way, as well as by the publication of its "Register," the Club will render valuable services to the agricultural interests of the country, and by concentrating its energies on a single meritorious race, will give to that race all the prominence that it so richly merits.

PRIZE ESSAY ON JERSEY CATTLE.

BY L. S. HARDIN.

It is only within the last half dozen years that the Jersey cow has come prominently before the American public. To say in that short time she has won golden opinions from troops of friends, is but a beggarly return for the many obligations we are under to her.

She is rapidly teaching us to eat a better article of butter, to make it with less cost, of a much finer quality, and from a smaller quantity of milk, to say nothing of her having enlisted many of the most intelligent agricultural minds of the country in behalf of the important art of cattle breeding.

To estimate her at her proper value, she should be judged from two points of view: first, as an agent in the production of cream and butter; and, secondly, as a thoroughbred.

There is little danger of over-estimating the importance of her character in this first particular. One of our best writers upon dairy subjects estimates the present annual yield of butter in the United States at seven hundred millions of pounds. At fifteen cents a pound, it is worth one hundred and five million dollars; at fifty cents a pound, three hundred and fifty million dollars. These figures, marking the extremes of current prices paid for butter, show a premium offered by the consumers of two hundred and forty-five million dollars as an incentive to improvement in butter making, to say nothing of top prices at one dollar and twenty-five cents a pound.

The expense of making the higher grades of butter is not over ten cents a pound *extra*, while the difference in price, in some instances, reaches one dollar and ten cents a pound. Surely, here is sufficient inducement for dairymen to use every means in their power to improve the quality of their butter product.

That the Jersey cow is an important agent in accomplishing the end in view, is rapidly becoming an acknowledged fact. She not only produces milk from which butter can be made of a finer and more consistent texture, but her presence in the herd seems to arouse the ambition of her owner, so that it is rare indeed that the butter from a herd of Jerseys does not bring the highest prices, and often double the price of any other butter in the market.

The Jersey cow, simply as a dairy animal, needs no other treatment than should be bestowed upon dairy animals of any other breed. Being somewhat small of stature, and trained to stick to her work, year in and year out, though her exceptional weekly records stand among the best, yet her forte is not so much in giving a large yield of butter, for a few

consecutive days, upon flush pasture, when fresh, as it is to furnish the greatest possible yearly yield of butter.

It is customary with many dairymen to carry their cows through the Winter nearly dry, have them come in fresh in the Spring, and put them on flush pasture. This puts a cow's system to its greatest strain just at the season when her product is selling at its lowest figures; and as a cow can yield but so much milk in a twelvemonth, this Spring forcing must have the effect of causing a corresponding decrease in Winter, when the cow's product is selling at high prices. But, in order to produce the largest possible yield of milk, the cows should be stinted so as to drop their calves late in the Autumn. The cow's nature, responding to the demands of maternity, furnishes sufficient stimulant for a flush flow of milk during the Winter months, while the succulent grasses of Spring and Summer prevent in a great measure the natural decrease as she approaches another parturition. If a cow holds her flesh well, she should be milked to within a few days of calving. It is questionable if the embryo calf is much of a drain upon the cow, as it requires but a little over three ounces of nourishment in twenty-four hours for its support. That cows when milked up to calving time sometimes fall off considerably in the next season's yield, can be attributed correctly to a fact observed by most dairymen, that a cow giving an exceedingly flush or long yield one year sometimes rests herself the succeeding one, alternating in the amount of her yield similarly to the habit of most fruit trees.

To get the largest yield, a mixed system of soiling and pasturing should be adopted; one acre of pasture to each cow for an early Spring, Midsummer, and Winter bite to color the butter, Fall-sown rye for Spring feeding, first cut of red clover to follow the rye, Spring-sown barley and oats mixed to follow the clover; corn fodder, sown in drills three feet apart, early in the Spring, and every succeeding second week until August, to finish out the Summer feeding. For Winter feeding, corn fodder or straw, cut in half-inch lengths, and mixed wet with mill feed, supplemented with a half peck of beets a day, makes the best feed when a profitable return of butter is required. A high grade of butter must be made to pay the bills for this extra treat of beets. Cabbage and turnips are almost certain to rob butter of that high aromatic flavor that secures the highest prices in the market. They are few indeed who eat a whole firkin of butter before detecting the presence of musty hay or stale water in the cow's food.

The milking should be done quietly, quickly, and thoroughly. Female milkers are necessary characters in a pastoral poem, or the picture of a dairy scene, but in the cow stable men are much to be preferred, as they can rest the bucket between their knees, and hold their own against a fractious heifer. In training a heifer to milk, strength and firmness are necessary, but, above all things, no violence should be used. If Jersey heifers are handled before calving as they should be, there will be no trouble in milking them.

AS A THOROUGHBRED.

We have thus far treated of the Jersey from a purely domestic and commercial point of view; but it is as a thoroughbred that she enlists our liveliest interest. Within the last year we have seen a few hundred dollars' worth of butcher's meat, by the magic art of breeding, turned into a princely fortune. If the same skill can be enlisted in behalf of

breeding Jersey cattle, may we not soon hope for equally satisfactory results?

It is extremely rare in this country that an animal belonging to any of the dairy breeds sells for more than a thousand dollars, while Short-horns are selling at fabulous prices.

This peculiar state of affairs is frequently accounted for upon the hypothesis that the beef interest is of much greater value than the dairy interest.

By the census returns it appears there are in the United States and Territories, a little more than one half as many milch cows as there are of other cattle. By Allen's valuation the "other cattle" are worth a little over one fifth more than the milch cows, as they stand on foot. Scarcely one fifth of the "other cattle" can be properly credited to beef cattle. A dairy cow, well selected, wisely and economically handled, will pay a profit equal to her first cost every twelve months, on an average, four years of her life. But aside from the fact that beef cattle of no other breed than the Short-horn sell at these fabulous prices, let us take a more homely view of the subject. In the City of Louisville, a well-to-do merchant's bill of fare for a week will usually contain the following articles: a roast of beef for Sunday, at one dollar and twenty-five cents, which answers for hash and a cold cut for Monday. Fowls, fish, mutton, veal, pork, and game, with three beefsteaks, at forty cents each, will finish out the week. This makes two dollars and fifty cents for beef. In the dairy line this same family uses seven pounds of butter, at fifty cents a pound, three dollars and fifty cents; seven gallons of milk, at twenty-eight cents a gallon, one dollar and ninety-six cents; not less than forty cents' worth of cheese, and fifty cents for veal—a total of six dollars and thirty-six cents for the products of the dairy, against two dollars and fifty cents for beef.

Families of more limited means reduce the amount of beef, and proportionately increase their supply of milk and cheese, while upon the farmers' and laborers' tables beef is something of a luxury, milk being as much a necessity as the ever-present bacon.

It is scarcely fair to class animals under two years of age as beef cattle, while the cow, after giving us four years of profitable milking, balances the beef account on the butcher's scales.

It may be that these high prices for thoroughbreds are mere fancy and speculation, but in the connoisseur's eyes a purely bred and highly finished thoroughbred is an exquisite work of art, not only possessing value for its present beauty, but having within it the creative power of stamping its wonderful image upon innumerable descendants. Suppose a Jersey breeder, by judicious breeding and wise selection, should produce a family of Jerseys, every heifer of which at three years of age should yield four hundred pounds of butter yearly, and this extraordinary quality should follow in each successive generation as certainly "as the night the day"—let this fact be known and believed by other breeders; what would a "pure bred" cow of that family be worth?

We know but little of the origin of Jersey cattle. Their resemblance to the present cattle of Normandy has led many persons to look for their origin in that direction. They probably are what on the island they are believed to be—a local pure breed, brought to the state of perfection they have now reached by their naturally isolated position, somewhat necessitating breeding in the line, and leading to a common aim or necessity on the part of the inhabitants. Nearly all of our improved breeds of animals have originated from a peculiar idea or desire taking

possession of a community. The idea may be started by an individual, but it will be taken up by the community, fostered, probably, by some real want or necessity of the people. With the tenacity that rural communities usually hold to any peculiar prejudice or tradition, the course of breeding originally adopted will be persevered in for generations, until a very distinct and valuable breed will be created. In this way have many hundreds of breeds of hogs and horned cattle been brought to a greater or less degree of perfection. But in cases when the general taste has changed, or the animal has been superseded by something better, the breed has been abandoned and lost in the surrounding natives. The inhabitants of the Island of Jersey have always been jealous of the high butter qualities of their favorites, and exceedingly loath to allow any crosses with foreign cattle. Accordingly, in seventeen hundred and eighty-nine, the Jersey Legislature forbade any importation of cattle under severe penalties. Guernseys have never been considered foreign cattle, and there have always been a few on the island, to which fact may, perhaps, be attributed the buff noses we occasionally now meet with in some excellent Jerseys.

The agriculture of Jersey partakes more of the practice of gardening than farming, hoed crops taking the place of general tillage. Apple orchards, roadsides, and small paddocks supply grazing in the place of extensive pastures. The cattle are usually kept in the stable and fed on roots, straw, and hay; and when grazing are tethered, or attended by children. This enforced familiarity between the cow and her master has induced the owner to study the nature and disposition of the cow, and the cow to adapt herself to the wants of her owner. Colonel Le Couteur tells us the care of the cow is generally left to the female members of the family; to which fact may be attributed the sweet and loveable nature of the cow, as undoubtedly the hand of woman has its refining influence even upon dumb brutes.

The Channel Islands are composed of Jersey, Guernsey, Alderney, and Sark. Sark does not seem to claim any distinctive breed of cattle. Alderney is the principal shipping point for all the islands, and has given to all cattle exported the common name of Alderneys. Youatt says: "All cattle, whether from the French coast or islands, pass under the common name of Alderney." Guernsey has a valuable and distinct breed of cattle, larger in size, coarser in structure, and redder in color than the Jerseys.

The cattle from Jersey have undoubtedly given the breeds called Alderney their particular prominence abroad. In England, as early as the days when Youatt wrote, we read: "It is fashionable that the view from the breakfast or drawing room of the house should present an Alderney cow or two grazing at a little distance." The Alderney was imported into and was a great favorite along the south coast of England more than a century ago, and a few animals were imported into this country in the early part of this century, and to a large extent by Mr. John A. Taintor, of Hartford, Connecticut, about the year eighteen hundred and fifty. They have been favorites in New England and in the vicinity of Philadelphia ever since their first appearance in this country. They were introduced into the West about the year eighteen hundred and forty, when they were brought into Kentucky by Mr. James B. Clay, of Lexington, Mr. R. A. Alexander, of Woodford County, and by Colonel Anderson, of the Soldiers' Home, Harroldsburg.

The prices ranged from one hundred dollars to three hundred dollars for cows, depending upon milking qualities. But the publication of the

"Herd Register" by the American Jersey Cattle Club gave prices a new impulse; and now it is difficult to buy a first-class registered cow for less than from three hundred dollars to five hundred dollars.

Upon the skill displayed in selecting the bull, will depend the success or failure of the breeder. A bull should, if possible, have a pedigree running back for three or more generations, through strains of representative butter makers. In form and color he should be as near faultless as possible, as the sire has the greatest influence in these two respects upon the offspring. In form he should be judged by the scale of points prescribed by the Royal Agricultural Society of Jersey. More particularly, he should have a blood like look, be light and airy in his carriage, have delicate limbs, a small head, set rather lightly on his shoulders, with light, yellow, crumpled horns, and a long, slim tail. He should be deep in the flank and open in the twist, with no tendency to fatness about the thighs, and carry in his rear the ensign of a race of milkers—a broad escutcheon. If of fine, vigorous constitution, the closer he is bred, the better. The richest colored calves are got by light colored bulls from dark reddish or brown cows.

The crucial test of a good bull is in the result of his breeding. His female offspring from good cows should be uniformly deep, rich milkers, and of good forms and colors. Any decided and uniform defect may be correctly attributed to the bull. The most desirable quality in his breeding is evenness. The production of prodigies is apt to be evidence of eccentric breeding. Uniform excellence is the highest evidence of fine breeding. Jersey bulls have the reputation of being possessed of unamiable dispositions. Being possessed of a light and active physique, and all the hot blood and chivalrous spirit that seems to be inseparably connected with aristocratic birth and the possession of a long array of high-toned ancestors, is it any wonder he is at times inclined to put on airs? Acts properly attributable to viciousness in one animal may be only playfulness in another. Keeping a bull in a stall is apt to render him more or less impotent. Allowing him to run with the herd is dangerous to the herdsman, to stock, and to fences, and is particularly disagreeable to strangers desiring to examine the herd. My own plan is to have a box-stall with a small yard attached. The bull has free range of both, and the cows are turned in to him.

As a rule, the prices received for thoroughbred males of both beef and dairy cattle are not as satisfactory as the prices received for females. The extreme fancy prices paid for animals are usually paid by breeders only who require but one male to some fifteen or twenty females, making from this source fifteen or twenty times the demand for females over males. There are but few farmers or graziers who raise their beef cattle. They usually buy yearlings or steers and dry cows to fatten, which accounts for a naturally small demand for beef bulls. But does this rule apply to dairymen? They, as a rule, keep bulls, while in butter dairies the calves are generally selected and raised with great care, but with a total disregard to the remote ancestry of the bull. If he is out of one of the best cows in the herd, this is usually considered sufficient. I am happy to state that matters are improving in this respect. In the East we hear of the increased demand for Jersey bulls from farmers and dairymen, while at the West I can bear witness to a decided waking up to the importance of using pure bred bulls in the herd. From present indications we can look forward with perfect confidence to see Jersey bulls sell, within the next half dozen years, for as much as, if not more, than we are now receiving for females of like ages.

THE COW.

In selecting a Jersey cow, the first object to be taken in view is her capacity for producing a large yearly yield of butter; and to the breeder it is not only important that she should be a typical or representative cow, but should have the capacity to reproduce her good qualities in her offspring. In her general structure all the good points of her breed should be fairly represented. She should possess, if possible, all the points prescribed in the scale of points, and should of course have an unimpeachable pedigree. Fortunately, it no longer requires the national reputation of a breeder to give currency to a pedigree. A *bona fide* number from the "Herd Register" of the American Jersey Cattle Club stamps the article as genuine.

Colonel Le Couteur tells us: "The north and northwest coast of Jersey is high and precipitous; a bold, syenite rock rising two hundred and more feet from the level of the sea." Peculiar to this district are the small, fine limbed, hardy cattle. "The southward half of Jersey may be called an inclined plane, gradually and beautifully slanting to the seashore, watered by innumerable streams." To this section belong those animals larger in carcass, and thought by some to be handsomer and more delicate. Hence in this country we remark two prevailing types of Jerseys. One is generally of light yellow color, with considerable white, rather waxy horns, sometimes buff noses, and rather large and coarse in the general make-up. The other type is smaller, with rather fine bones, generally of darker color and black points, small, smooth horns with black tips.

There is no choice between them as butter producers. There is much diversity of opinion upon the subject of the correlation between the perineum, or, as it is commonly called, the escutcheon or milk-mirror, and the activity of the milk-secreting glands. Very few, if any, modern writers upon cattle have accepted the complicated theory of Guénon, while no two of them agree as to the exact value of the escutcheon. As a point of beauty it should certainly be cultivated in the herd. As to its practical value for indicating the milking qualities of the cow, my experience is that a finely developed escutcheon is rarely seen on a small milker, while many excellent milkers have very small or no escutcheon at all. In other words, its presence is a good sign, while its absence is not necessarily a cause for distrust. Milk veins, as an indication of milking capacity, are of about the same value as the escutcheon.

A Jersey udder should be square and well tucked up, not pendulous, and extend well forward along the body. All four sections should be of equal capacity. Such an udder is comfortable to the cow, and gives symmetry to this the most important part of her body. The teats should be set wide apart, and be of sufficient length and softness to be easily milked. There is no greater defect in a dairy cow than a short, hard teat.

CALVES.

The most approved plan for raising calves is to take them from the dams when four or five days old, teach them to drink, and feed them fresh milk from the cow, gradually adding sweet skimmed milk, and, as the fresh milk is abandoned, adding ground cooked food. After the calf is four or five weeks old, the rich food should gradually be supplanted by muscle-forming food, until the calf-fat has disappeared, and the calf

is left in only fair condition. The evil effects of keeping a calf too fat may not be perceptible in the same animal when grown; but any system of feeding or breeding should be judged not by its immediate effect upon an individual, but by the consequences upon a whole herd of animals, if that course should be persisted in for a great number of years. The system of feeding adopted cannot be too closely watched. A scant supply will shorten the butter capacity of the herd, while too luxuriant pasture will turn Jerseys into Short-horns. The aim should be to give them such a liberal supply of butter producing food as they can bear without producing fatness.

There is no point of mere fancy about a Jersey of more importance than the horns. Imported cows and bulls, as seen in this country, have both horns describing similar curves, while with native bred Jerseys it is quite the exception. A yearling's horns should be dressed with a rasp, scraped, oiled, and put in clamps as soon as a tendency to wildness of growth is discovered.

The subject of acclimating Jerseys in the Southern States needs more light than has yet been shed upon it. I have shipped Jerseys to many of the Southern States for several years past, and none of them have had the fever. I attribute my success, whether correctly or not, to the fact that they were all calves, and raised in thin condition; and I think the least risk will attend such shipments when made in the Autumn, and only calves, thrifty, but thin in flesh, and not over six or eight months of age, are sent. They should be kept out of the hot sun and heavy dews, never allowed to become fat, receiving green food only in Summer, and having always pure water to drink. The trouble is probably more or less local.

GRADES.

After a pretty full experience I am prepared to give my unqualified praise to Jersey cross-breeds and grades. The produce from coupling a Jersey bull of good quality with an Ayrshire cow of similar character, is usually an excellent butter cow. So, if native cows of good quality are chosen, the grades from them, by use of a good Jersey bull, may be expected to be superior butter cows. In breeding for grades, the bulls should invariably be thoroughbred. If the native cows are white, black, yellow, or dun color, the offspring resemble thoroughbreds very closely.

In conclusion, it is safe to state in behalf of this breed of cattle, that the Jersey cow, as a general rule, will yield in a twelvemonth from a third to one half more butter than cows of any other breed. It is therefore advisable that dairymen whose specialty is butter making, should introduce into their herds Jersey bulls having first-class butter pedigrees, and save the cow calves by these bulls from the best cows in the herd. For private families, nothing is more pleasing to all the members of the family than the fawn-like appearance of the young calves or the quaint beauty of the matured cow; while the extraordinary quality of the milk and yeast-like richness of the cream, yielding deep colored and nutty flavored butter, win the never-ending praise of the good housewife.

SHEEP RAISING.

THE ART OF SHEEP RAISING

FOR

WOOL, MUTTON, AND MONEY.*

The present paper will treat of the diseases of sheep and their remedies; and herein, first, of

SCAB.

I will not affirm, as of my own knowledge, that scab is caused by an insect, but going on the principle that a man will become very old before he learns everything by personal experiment, I accept the theory advanced by such writers as Walz of Germany, Youatt of England, and our own countryman, Dr. Randall—men who have made a lifelong study of sheep and their diseases, and than whom I can imagine none better to quote from. Walz says: "If one or more female *acari* are placed on the wool of a sound sheep, they quickly travel to the root of it, and bury themselves in the skin, the place at which they penetrated being scarcely visible, or only distinguished by a minute red point. On the tenth or twelfth day a little swelling may be detected by the finger, and the skin changes its color and has a greenish blue tint. The pustule is now rapidly formed, and about the sixteenth day breaks, and the mothers again appear with their little ones attached to their feet. These little ones immediately set to work and penetrate the neighboring skin, and bury themselves beneath it, and find their proper nourishment, and grow and propagate until the poor animal has myriads of them." This female acarus, it is stated, brings forth from eight to fifteen at a hatching.

I have detected on scabby sheep a parasite which may be examined by a common magnifying glass, and which I suppose to be the acarus that causes the scab with us, though it is quite different in structure (although of about the same size) from the species described and figured by the above named writers. The acarus of Walz is figured as a sac of irregular outline, having the four corners drawn out to form four pairs

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* For the commencement of this article, see page 449.

of large, irregular branching legs. The parasite I have observed is a regular oval in form, in outline not unlike the body of a wood-tick, white and semi-translucent like a particle of spermacetti or wax, and having three or four (I forget which, for it is some years since I have had any scab) pairs of legs attached symmetrically to the anterior portion of the body. The legs are reddish-brown in color.

Almost anything that is destructive to insect life will cure scab if applied in liquid form and hot—say at about the temperature that the hand can bear comfortably; but no mixture, however poisonous, can effect a cure with a single application. It should be applied about three times, and at intervals of say ten days. Having a scabby sheep on hand, we must assume that the parasites infesting it are existing in every stage of their brief career. There are those which have just emerged from the skin with their young. those which have just burrowed into the skin to bring forth their young ten or twelve days hence, those which have been buried five or six days, above whom the pustule has formed, and yet others at every stage between the two extremes of their career. Now, you can break the pustules (or most of them), and reach with your poison the occupants of these, and the free acari that may happen to be on the outside of the skin, but you will not reach all of those that have just retired within it. You may poison the wool so that were these to emerge the next day it might be they would also perish. But a few days' growth of wool must be ample for the preservation of such microscopic life. Within a fortnight, then, from the first application of your wash, a second generation of acari has matured and embarked upon its mission of "increase and multiplication." These considerations make it easy to understand why a second and third application of the remedy, at intervals of about ten days, are requisite to insure the cure and eradication of the scab.

Soon after shearing is the best time to perform any of the operations hereafter described; the wool is then short, it takes less liquid to saturate, and you have a better chance to "take in the situation" generally.

SPOTTING SHEEP.

"Spotting" sheep consists in placing the sheep's head into some stationary yoke and doctoring such spots on the sheep as can be discovered to be affected by the scab. The yoke may be made of a forked limb of a tree; or, take four-by-four scantling and spike on two-by-four pieces with holes bored through the same; have a peg or bolt that can be inserted freely into these holes so as to keep the sheep from disengaging his neck or head from the yoke after he has been placed in position. The yoke is to be set firmly into the ground or into the floor of the place where the work is to be done. Next inspect the sheep for scab thoroughly, and with a swab dipped into the "wash," rub all places that show trace of scab or even look suspicious—for it is easy to overlook a patch the size of one's hand if the operator be not up to his work. A sheep whose fleece is yet entire may be quite scabby, and need only a few weeks to lose large patches of wool, yet to the casual observer there may be nothing wrong. These places in the wool are lighter colored than the balance of the fleece, and have a dried up, white appearance, that one may soon learn to detect as readily as he would were the wool off and an ugly sore formed. Either in spotting or dipping sheep I would see that all bad places that are sore or "scabby," as the term would imply, should get an extra allowance of doctoring.

Some advocate rubbing or scarifying the parts with a currycomb until they bleed. This looks cruel, but I would do it if I had any doubt that the liquid was thoroughly penetrating every part of the wool clear to the skin. I found it convenient to use an ordinary mechanical oil can filled with coal oil. With this the oil can be squirted into such places, and then a slight kneading or rubbing in with the fingers will cause it to penetrate all parts. And, in fact, for "spotting" sheep, coal oil, if not considered too expensive, is one of the very best applications that can be used in cases of scab.

From this account of the process it will be seen that "spotting" is at best only a halfway plan for doing the work. I have seen open-wooled sheep do quite well when treated by this method; still, one is always in doubt as to its thoroughness. When scab has once appeared, it is better to "dip" the sheep each Spring, continuing it for a season or two after the infection appears to have been eradicated from the flock and from the range. Hence it is best to prepare at once for dipping, just as one prepares shearing pens, etc.; for the new hand wants to bear in mind that, no matter how "lucky" some of his older neighbors may appear to be in keeping down scab in their flocks (which, perhaps, are of common and open wool sheep), still, as the new flock goes on improving each year, and particularly of breeding up in either of the merino varieties, the owner is liable to become disgusted at times with the imperfect success of his efforts to keep down scab by "spotting."

DIPPING.

"Dipping" sheep, as the term would imply, consists in submerging the whole animal in the liquid or "wash" used for the scab. For this purpose a trough or box of appropriate size is required to contain the liquid. After being dipped, the sheep is to be taken out and placed on a shelf or platform near at hand, set at such an inclination that the liquid, as it drains off the animal, shall flow back into the dipping trough.

Where a large flock is to be dipped, a platform or pen is usually arranged large enough to accommodate fifty to one hundred sheep at a time, the floor so inclined that the liquid which drains off them shall flow back into the dipping trough. The trough is also so arranged that the sheep may be driven through it, thus obviating the necessity of catching and holding each animal. Each shepherd has, of course, his own ideas of a pen and dipping trough, and I shall give my own for what they may be worth.

TROUGH AND DRAINWAY.

Construct of two-inch plank a tough twenty feet long, four feet deep, and sixteen inches wide, with the floor at each end so inclined that a sheep can walk into it and out again. This is to be sunk in the ground, its top level with the surface. At the end where the sheep are to come out, build a long lane rising as an inclined plane—say fourteen inches wide. The floor of this is to be of two-inch plank, and before laying it run a carpenter's plow, or grooving plane, along each edge of the surface that is to be uppermost, and on which the sheep are to walk. Lay the first plank with the depressed end projecting enough into the dipping tough to let the liquid falling on it flow back into the trough, and let it be inclined, rising from the trough at the rate of say one foot to the rod. Lay the next plank in the same manner, "end on" to the first, and lap-

ping it say four inches, shingle fashion, and thus continue; forming the floor of the lane, each sixteen-foot plank forming fifteen feet four inches of floor. Pains should be taken to preserve the uniform gradual rate of ascent, the planks being supported at every four feet. Now strike two chalk lines, six inches apart, up the center of the lane—thus dividing the floor into three strips, the two at the sides being four inches wide, and the center one six inches wide. Next take one-inch lumber, twelve inches wide and sixteen feet long, and set on edge along the chalk lines—the lower edges to be "toed in" to the floor, and the top edges nailed to each side of the lane. These side boards cause the liquid dripping from the sheep to run down to the center (six-inch space) of the floor—which, by the way, is a width ample for the sheep to walk on. If this lane be built by a carpenter the lower edges of these side boards will be leveled, so as to fit snug upon the floor. If this lane and dipping apparatus can be built on the slope of a hill, and alongside of a fence, ascending the hill, it will be a material advantage, as the lane then can be built much longer, and the fence serves for one side of it, ready made. There must be such a corral around the dipping trough that the sheep can be driven through the trough. With wild active sheep, it may be needful to have a screen of boards on each side of the trough, so as to keep the liquid from splashing out upon the ground. The "wash" should be kept just deep enough to swim the sheep. How to heat it and keep it heated, I leave to the reader; probably the simplest way is by introducing hot stones. But where a head of water is available I should never rest till things were so arranged that by turning a faucet I could have hot or cold water at will.

This plan of constructing a dipping lane has several advantages over others. With some pens, it is needful to wait till the last sheep dipped is drained before the pen full of sheep can be let out. In this lane each sheep moves out in the order in which it was dipped, and by simply shutting back the last two or three as they come to the end of the lane, you can go on working at the trough; or with a sufficiently long lane, a continual line of sheep can be kept moving. There are no joints in the floor to shrink open between one season's dipping and the next; and, on this consideration, I should, perhaps, lay the greatest stress. The floor planks overlay each other like so many shingles, and nothing but a check or split in the plank can cause a leak, even though the structure stand exposed to the sun and rain for years.

SULPHUR AND SALT.

Simultaneously with the external applications, I give salt and sulphur freely, mixing in about equal bulks. The crude California sulphur will serve, which comes in great blocks, and costs but a few cents per pound. It need not be pulverized; if broken into pieces the size of a walnut, it is sufficient. The sheep gnaw and munch at these with apparent relish. After the external applications are concluded, I would continue to give some sulphur with the salt during the remainder of Summer. After the rains set in the sulphur should be discontinued.

Subjoined are several recipes for preparing

SHEEP WASHES

For the cure of scab:

First—Simple decoction of tobacco, made strong—using say twenty-five pounds of leaf to one hundred gallons of water.

Second—Tobacco, twenty pounds; potash, six pounds; lime, six pounds; tar, two quarts; to one hundred gallons of water. Make the potash and lime into a thin paste; add the tar, and mix till they combine; then stir into the tobacco decoction, which should have been heated to the boiling point.

Third—Make a strong pickle of salt and water, and to every two buckets add one bucket of strong whitewash (of lime); this should be put only on sheep recently shorn.

Fourth—Pulverize finely one pound of corrosive sublimate, and add it slowly (no faster than it will dissolve) to one hundred gallons of water. This is a very effectual wash, but unless the proportions are strictly adhered to, had better not be used. This is the cleanest and pleasantest dip used, and in the above proportions sufficiently innocent.

IS LEGISLATION IN ORDER?

Taken in time and followed up with due persistence, scab can always be controlled completely, but until a radical reform is wrought in this feature of California sheep husbandry, no one can be permanently safe against it. Any fallen log or piece of fence against which a scabby sheep may have rubbed itself, suffices to start the disease again in a flock a full twelvemonth after it has apparently been effectually eradicated. Shearers may bring it on their clothes from a neighbor's pen. If a public road run through the farm, a flock is not safe in changing from fields on one side of this road to others on the opposite side—scabby sheep may have been driven along it and left the contagion behind them. In Australia, I learn, it is made a misdemeanor, punished by sharp penalties, to drive scabby sheep on a public highway, or to have them in possession without taking prompt measures to cure them; and that fundamental principle of justice and our common law—that "a man shall so use his own property as not to injure his neighbors"—authorizes and demands the enforcement of this regulation; at least, as to driving along the public highway. It will be observed that the driving of scabby sheep over the face of the country is a liberal distributing of sure poison, against the injuries of which no care or precaution can guard. It will, I think, be conceded, that we have at least as much right to protection against this injury as against the firing of paper gun wads amongst our dry grain, or any other gratuitous and mischievous nuisance. None will object to such a regulation except the owners of scabby flocks, which, as I have shown, are frequently flocks that their owners have merely neglected. If our great flocks of Merinos are to continue developing, nothing can contribute to that end more than the wise regulation above cited. But its enforcement is not to be asked on the ground of fostering or promoting sheep husbandry. It is sufficient and proper to ask it on the single ground of justice, because it is right, and goes to put down a wrong.

OTHER DISEASES.

Scab is the only infectious disease, within my experience, that the California shepherd has to contend with to any extent. I have heard of the rot, and several others; but as to the rot, I have yet to see the first flock afflicted with that disease—as it is described by the older writers of the Atlantic States and Europe. I have seen

ULCERATED SORE FEET.

These are easily cured by paring them down and applying some caustic (say bluestone or sulphate of copper) once or twice. Apply this remedy in time and there will not commonly be any more of this form of "foot rot" in the whole flock. I have also seen

FLUKES,

Or fish-shaped parasites in the liver. These and grubs in the head are quite common, and at some seasons of the year it is the exception to open a carcass without finding them—particularly the grubs. This parasite does not confine itself to the sheep, as any old hunter will testify that he has found them equally abundant in the heads of deer and elk.

GRUBS IN THE HEAD

Are a first-rate thing to doctor for, when the flocks get out of order, and you can lay the trouble to nothing else. It is like the "hollow horn" in cattle, which is commonly an euphemism for starvation and exposure. The remedy is simple and similar—move the sheep to better range and feed, being sure that they have access to plenty of water and salt. Perhaps I should say plainly that grubs in the head and flukes in the liver never hurt any sheep, and need no remedial treatment.

In warm weather, and particularly during the months of June and July, attention must be paid to the operations of the

BLOW FLY.

Any sheep that appears to be restless or uneasy should be examined. The case may be one of scab, but often it will be found that some wound has become filled with maggots. It is not necessary, however, that the sheep should have been wounded, for these pests to appear. Any little collection of dung around the breech will tempt the fly to deposit its eggs, and often, on Merinos, the eggs will be deposited in the clean wool—generally about some wrinkle. Application of coal oil, turpentine, or any of the sheep washes, will remove the evil; but if the maggots have eaten into the flesh and formed a bad sore or wound, the proper treatment is to wash the parts clean and apply powdered calomel.

Sometimes a sheep will have a

COLD IN THE HEAD.

I daub a little tar on the nose. I do so because I saw another man do it, and the sheep got well.

Sheep will become

LAME,

Sometimes, as if they had rheumatism. Often this is caused only by a pellicle of dry or frozen earth in the cleft of the hoof. The cure, of course, is to remove it. I have heard lameness, not otherwise explicable, attributed to an alleged stoppage of the "biflex canal." I do not believe it, for I have never discerned any stoppage in the canal. As many, even among old shepherds, have never seen this canal, I will say that it is situated in the cleft of the foot, about the juncture of the hoof and hair. It resembles one of the little holes that are on the inside of

the hog's leg. At the inside extremity is a pouch, apparently formed by a continuation of the outside skin, being lined with hair, and secreting a viscid. Sheep may also have what is called the

BLIND STAGGERS—

Refusing to eat, and turning continually around, or staggering. Some become totally blind. I do not know of any remedy that is of any account. Either old sheep or lambs will occasionally have the

SCOURS,

Or diarrhea. For this give plenty of salt, and change to dry feed.

With the exception of the few remedies mentioned above, I have but one cure for any sheep that did not thrive on good grass, water, and salt, and that is: to eat it the first time it did get fat, or to sell it very cheap to any one who wanted to take the chances with it. For, though I have had "good luck" always with flocks of sheep, still, with single sick sheep it has been just the other way. I should always single out or mark for the butcher any sheep that is continually poor or unthrifty in a flock of the same age and grade as itself, no matter how fine it might be in other respects. Perfections and imperfections are transmitted to offspring about equally, and in breeding from such sheep you are continually with a lot of the same sort on your hands.

INJURIOUS FEED-GROWTHS.

There are very few grasses or vegetables in California that are injurious to sheep—the only two that I have known to kill them being the laurel and the "rattle-weed." Sheep will only touch the former during a scarcity of feed. They will eat the rattle-weed freely, and the only remedy I know is that of exterminating it from the range.

IN CONCLUSION.

The standard manuals of sheep husbandry give a good deal of space to sheep diseases, their symptoms, nature, and remedies, and may be consulted by such as are curious. I can only reiterate my opinion, based on the experience of having gone through the mill, that the foregoing simple directions are all that can be followed with real profit by the California sheep man who is in the business for "wool, mutton, and money." Breeders of thoroughbred stock may find it worth while to experiment with greater pains, especially to save some single animal of considerable value. But all the circumstances that usually attend the breeding of thoroughbreds are different from those of the ordinary sheep raiser or farmer. Feed and shelter are different; and the value of the animal on which the extra pains and expense may be expended is very different indeed. I commend these considerations to the inexperienced sheep man who may have imbibed other and more ambitious views from perusal of the manuals of sheep husbandry—valuable and scientific as these are. He is to remember that nine tenths of their matter is addressed, not to him at all, but only to the breeder of thoroughbreds, and will "pay" in practical application only with their valuable, high-priced animals.

TRANSACTIONS

OF THE

SANTA CLARA VALLEY AGRICULTURAL SOCIETY,

FOR

THE YEAR 1874.

REPORT.

To the honorable the State Board of Agriculture of the State of California:

GENTLEMEN: Pursuant to the statue in that behalf enacted, I have the honor to submit the following report of the proceedings of the Santa Clara Valley Agricultural Society, for the year eighteen hundred and seventy-four.

FINANCIAL EXHIBIT.

Balance on hand, as per last report	$3,723 26	
Amount received from all sources since last report	9,535 01	
		$13,258 27
DISBURSEMENTS.		
By amount paid out for improvement of grounds, etc	$2,420 19	
By amount paid out as expenses of Fair	2,361 58	
By amount paid out for premiums	5,489 00	
		$10,270 77
Balance cash on hand December 3d, 1874		$2,987 50

PREMIUMS AWARDED AT THE PAVILION.

GARDEN PRODUCTS.

Exhibitor.	Article.	Premium.
W. A. Z. Edwards	Best squashes	$2
W. A. Z. Edwards	Best carrots	$2
J. H. Cornthwaite	Best sack onions	$3
M. Nelson	Best twenty pounds tomatoes	$2
C. Cappelli	Best cucumbers	$2
C. Cappelli	Best all kinds vegetables	$10
M. Fernandez	Best melons	$2

FRUITS.

Exhibitor.	Article.	Premium.
S. Q. Broughton	Best collection of apples	$15
A. M. Ogier	Best single variety of apples	$5
S. Q. Broughton	Best single variety of pears	$5
John Rock	Best collection of peaches	$5
John Rock	Best collection of prunes	$5
D. M. Harwood	Best collection of foreign grapes	$10
D. M. Harwood	Best single bunch of foreign grapes	$3
D. M. Harwood	Best single bunch of Mission or California grapes	$3
S. P. Stockton	Best collection of wine grapes	$10
John Rock	Best gooseberries	$3
John Rock	Best currants	$3
John Rock	Best pomegranates	$3
	Canned fruits.	
J. M. Dawson & Co.	Best canned fruit	$10
Mrs. L. J. Watkins	Best fruit hermetically sealed in glass	$10
	Preserves and jellies.	
Mrs. L. J. Watkins	Best jelly	$10
	Dried fruit.	
L. A. Gould	Best dried apples	$2
L. A. Gould	Best dried apricots	$2
L. A. Gould	Best dried cherries	$2
L. A. Gould	Best dried currants	$2

FRUITS—Continued.

Exhibitor.	Article.	Premium.
L. A. Gould	Best dried blackberries	$2
L. A. Gould	Best dried rhubarb	$2
L. A. Gould	Best dried onions	$2
L. A. Gould	Best dried tomatoes	$2
Preserving Company.	Best dried prunes and plums	$5
Preserving Company.	Best dried pears	$2
Preserving Company.	Best dried peaches	$2
	Nuts.	
L. A. Gould	Best collection of nuts of all kinds	$10
J. J. Roberts	Best collection of soft-shell almonds	$3
Mrs. L. J. Watkins	Best collection of hard-shell almonds	$2
A. M. Ogier	Best collection of chestnuts	$2
Wm. Boots	Best collection of English walnuts	$2

PLANTS AND FLOWERS.

Exhibitor.	Article.	Premium.
John Rock	Best collection of hardy ornamental evergreen plants	$25
John Rock	Best collection of assorted plants, all kinds	$10
John Rock	Best collection of roses in pots	$5
John Rock	Best collection of cut roses and dahlias	$5
L. F. Sanderson	Best collection of greenhouse plants	$25
L. F. Sanderson	Best collection of cut flowers	$5
L. F. Sanderson	Best five vases bouquets	$5
L. F. Sanderson	Best collection of parlor bouquets	$5
L. F. Sanderson	Best collection of hand bouquets	$2
L. F. Sanderson	Best collection of fern and leaf plants	$10
L. F. Sanderson	Best collection of hanging baskets	$3

NATIVE WINES AND LIQUORS.

Exhibitor.	Article.	Premium.
C. M. Klatz	Best dry white wine	$3
S. P. Stockton	Best sweet white wine and dry red wine	(each $3) $6
S. P. Stockton	Best sweet red wine	$3
S. P. Stockton	Best port wine	$5
S. P. Stockton	Best grape and pear brandy	(each $3) $6
D. M. Harwood	Best Madeira wine	$3
D. M. Harwood	Best catawba wine	$3
D. M. Harwood	Best angelica wine	$3
D. M. Harwood	Best vinegar	$3
S. P. Stockton	Best exhibit of wines	$10

DAIRY PRODUCE—(CALIFORNIA.)

Exhibitor.	Article.	Premium.
O. W. Farnsworth	Best cheese	$10
Wm. Boots	Best butter	$5

BREAD AND PASTRY.

Exhibitor.	Article.	Premium.
Mrs. L. J. Watkins	Best domestic brown bread	$2
Mrs. L. J. Watkins	Best domestic white bread	$2
Chas. Matigan	Best six loaves bakers' bread	$5
Emily Rodgers	Best exhibit of cake	$5

EMBROIDERY, NEEDLE, AND FANCY WORK.

Exhibitor.	Article.	Premium.
Mrs. C. W. Clark	Best wax work	$5
Mrs. L. F. Chipman	Best crochet work	$2
Mrs. A. Boardman	Best cone work	$2
Mrs. S. P. Sanders	Best rug tufted work	$5
Mrs. S. P. Sanders	Best worsted work	$2
Mrs. A. O. Armsden	Best article knitting work	$2
Miss M. D. McChain.	Best display of silk embroidery	$5
Miss M. D. McChain.	Best knitted shawl	$2
Miss M. D. McChain.	Best worsted crochet	$2
Miss M. D. McChain.	Best suit of child's clothes	$5
Miss M. D. McChain.	Best set lamp mats	$2
Miss E. Lightstone	Best hair work	$2
Miss M. D. McChain.	Best afghan	$2
J. Lind	Best shell work	$5
Miss S. J. Watkins	Best wax shell work	Premium recommended
Mrs. W. C. Wilson	Best embroidered ladies' collar	$2
Mrs. W. C. Wilson	Best article chenille work	$2
Mrs. W. C. Wilson	Best cambric embroidery	$2
Mrs. J. Demar	For fancy needlework	Premium recommended
Mrs. G. P. Beal	Best tatting	$2

MILLINERY AND DRESSMAKING.

Exhibitor.	Article.	Premium.
Mrs. J. Loryea	Best display of ladies' bonnets and hats	$15
Mrs. J. Demar	Best display of dressmaking	$10

SEWING MACHINES.

Exhibitor.	Article.	Premium.
Wheeler & Wilson	Best sewing machine for all purposes	Diploma.
Wheeler & Wilson	Best sewing machine for fancy work	Diploma.
Wheeler & Wilson	Best exhibit of machine work	Diploma.

PAINTING AND GRAINING.

Exhibitor.	Article.	Premium.
Fred. Junk	Best carriage painting—second premium.	$5
Granger & Young	Best carriage painting—first premium	$10

FINE ARTS.

Exhibitor.	Article.	Premium.
Toland Hart	Best oil painting on canvas	$10
Edward Lewis	Best crayon drawing	$5
C. J. Lightstone	Best penmanship	$5
C. J. Lightstone	Best drawing with a pen	$5
Toland Hart	Best landscape painting—Cal. scenery	$10
Carl Browne	Best exhibit of painting as a fine art	$10
Carl Browne	Best portrait in oil	$10
Emily J. Peeler	Best pencil drawing	$5
Mrs. L. M. Curtis	Best portrait in water colors	$5
S. P. Sanders	Best exhibit of photograph views	$10
H. G. Peeler	Best water-color painting	$5
Mrs. L. M. Curtis	Best porcelain picture	$5
Miss Ellis	Best crayon portrait	$5
Matilda Lotz	Best oil painting of animals	$10

POTTERY.

Exhibitor.	Article.	Premium.
A. Steiger	Best display of pottery	$10

STOVES AND TINWARE.

Exhibitor.	Article.	Premium.
John Stock	Best cooking stove	$5
John Stock	Best exhibit of tinware	$5

DOMESTIC MANUFACTURES.

Exhibitor.	Article.	Premium.
Alex. Mackey	Best rag carpet	$5
Mrs. J. M. Owen	Best patchwork woolen bedquilt	$5
Mrs. A. M. Weatherhead	Best cotton home-made stocking	$2
L. Lion & Co	Best exhibit of gloves—California make	$15
Mrs. W. C. Wilson	Best plain sewing and needlework	$5
Mrs. Eliza Bradley	Best silk patchwork bedquilt	Premium recommended
Mrs. W. C. Wilson	Best cotton patchwork bedquilt	$5
J. S. Woods	Best exhibit of hats and caps	$5

SPECIAL OR DISCRETIONARY.

Exhibitor.	Article.	Premium.
A. Callahan	Farmer's vise and anvil combined	Diploma.
Reeve Bros	Wools' patent steam heater	Diploma.
Auzerais & Pomeroy	Exhibition of groceries, case goods, etc	Honorable mention.
Bowen Bros	Yeast powders	Diploma.
Dr. L. L. Moore	Pneumatic evaporator	Diploma.
John Stock	Milk pan and cooler combined	Diploma.
John Stock	Pump valves	Diploma.
William Aram	Water filter, cooler, and refrigerator	Diploma.
William Aram	Graft or scion cutter	Honorable mention.
J. Colyer	Sleeve buttons from California wood	Diploma.
J. Fugazi	Display of hair dye, oils, etc	Diploma.
Mr. J. Demar	Display of human hair and hair dressing	Diploma.

HAND TOOLS.

Exhibitor.	Article.	Premium.
A. Callahan	Best washing machine	$5
A. Callahan	Best beehive	Diploma.
G. A. Dabney	Best grain and seed separator	Diploma.
G. A. Dabney	Best churn	$5
E. K. Dunlap	Best patent combined iron	D ploma.
Auzerais & Pomeroy	Best lawn mower	Diploma.
P. McKenzie	Best improved deep well pump	Diploma.
William Aram	Best combination grafting iron	Diploma.
E. Harrison	Best derrick fork	Diploma.
G. Richardson	Best squirrel trap	Diploma.

IRON AND WOOD WORK.

Exhibitor.	Article.	Premium.
L. Chaize	Best exhibit of brass work	$5
D. McKenzie	Best exhibit of heavy castings	$10
D. McKenzie	Best exhibit of brass work (entered as agent)	Premium recommended.

HARNESS AND SADDLERY.

Exhibitor.	Article.	Premium.
H. Messing	Best ladies' saddle, California made	$5
H. Messing	Best gents' saddle, California made	$5
H. Messing	Best buggy harness, single	$10
H. Messing	Best buggy harness, double	$10
H. Messing	Best set team harness	$10
H. Messing	Best exhibit of harness and saddlery work.	$15

TANNED LEATHER.

Exhibitor.	Article.	Premium.
Jacob Eberhardt	Best exhibit of tanned leather, harness, sole and upper leather, squirrel skins, and glove tanned leather	$40

FARM PRODUCTS.

Exhibitor.	Article.	Premium.
John Stanfield	Best sack of wheat	$5
John Stanfield	Best sack of barley	$5
Moody Bros	Best sack of buckwheat flour	$5
Moody Bros	Best sack of cornmeal	$5
Moody Bros	Best sack of flour	$5
John Rock	Best sack of potatoes	$3
Isaac Dixon	Best exhibit of flaxseed	$5
A. Matty	Best exhibit of hams	$5
A. Matty	Best exhibit of ten pounds of lard	$5
Jessie Hobson	Best exhibit of oats	$5
A. Matty	Best exhibit of twenty-five pounds of salt pork	$5
A. Matty	Best exhibit of twenty-five pounds of smoked beef	$5
George W. Zimmer	Best exhibit of twenty-five pounds of corned beef	$5
A. Matty	Best exhibit of side bacon	$5
F. Hamilton	Best sack of rye	$5

WAGONS AND CARRIAGES.

Exhibitor.	Article.	Premium.
J. F. Falkner	Best freight wagon	$10
P. W. Reardon & Co.	Best express wagon	$10
Balbact Crydewise	Best family carriage	$20
W. T. Adel	Best buggy, one-horse top	$10
P. W. Reardon & Co.	Best buggy, one-horse open	$10
William Harrison	Best farm wagon	Diploma.
Chancey Ives	Fine two-horse farm wagon (eastern manufacture)	Diploma.

CABINET WARE.

Exhibitor.	Article.	Premium.
Bennett & Co	Best exhibit of cabinet ware and set of parlor furniture	$25
J. A. Jager	Second best exhibit of cabinet ware and chamber set	$10
J. B. Price	Second best exhibit of parlor furniture and chamber set	$15
J. B. Price	Best exhibit of spring mattress	$5
J. B. Price	Best exhibit of upholstery	$5
J. A. Jager	Best easy chair	$5

MARBLE WORK, SCULPTURE, AND STATUARY.

Exhibitor.	Article.	Premium.
Field, Coombs & Gregory	Best exhibit of marble work, California manufacture	$20
J. Ellis	Statuary in plaster	$10
J. Ellis	Medalion in plaster	Premium recommended.

AGRICULTURAL IMPLEMENTS.

Exhibitor.	Article.	Premium.
S. Towner	Best exhibit of willow work	$10
S. Towner	Best exhibit of rustic work	$10
M. C. Hawley & Co.	Best gang plow (John Deere)	$15
M. C. Hawley & Co.	Best cultivator (Chisset)	$10
M. C. Hawley & Co.	Best reaper (Buckeye self-raker)	$10
D. McKenzie	Best horse-power (Pelton's patent)	$10
D. McKenzie	Best harrow (patent tubular)	$10
Haskell & Mott	Best well auger	$5
Haskell & Mott	Best exhibit of blacksmith's work	$10
Auzerais & Pomeroy	Best mower (Champion)	$10
Auzerais & Pomeroy	Best plow (steel Moline)	$10
Kimball Manuf. Co.	Best hay press	$15
D. M. Harwood	Best road scraper	$5
D. McKenzie	Best grain sower (Vreedand's patent)	$5
Auzerais & Pomeroy	Best hay cutter (Hocking Valley)	Diploma.
Joseph Enright	Best steam engine (straw burner)	$20

SILK, CLOTH, THREAD, RIBBONS, ETC.

Exhibitor.	Article.	Premium.
J. Green	Best exhibit of silk ribbon	$10
W. P. Higginbotham.	Best exhibit of silk cloth	$10

CHILDREN'S DEPARTMENT.

Exhibitor.	Article.	Premium.
Laura Hellyer, aged eleven years	Best bread	Special premium recom.

FARMS.

Exhibitor.	Article.	Premium.
W. W. Montague.....	Best improved and cultivated farm.....	.....Premium.

NURSERIES.

Exhibitor.	Article.	Premium.
John Rock.....	Best nursery.....	.....Premium.

PREMIUMS AWARDED AT THE STOCK GROUNDS.

Exhibitor.	Name.	Animal.	Premium.
		Thoroughbreds.	
R. T. O'Hanlon	Turf Gallery	Best stallion, two years old	$20
Wm. Boots	Bob Wooding	Best stallion, one year old	$10
Wm. Boots	No name	Best stallion, suckling	$10
Wm. Boots	Miami	Best mare, three years old and upwards	$20
R. T. O'Hanlon	Sallie	Best mare, two years old	$15
R. T. O'Hanlon	Omega	Best mare, one year old	$10
		Families.	
Geo. Wilson	Rebel Daughter	Mare with family of four or more colts	$20
Wm. Hamilton	Winona	Mare with family of four or more colts	$15
		Horses for all purposes.	
A. A. Wetherall	Fred. Patchen	Best stallion, three years old and over	$30
Chas. E. Mitchell	San Juan	Best stallion, two years old	$20
J. Martin	No name	Best stallion, one year old	$10
Wm. Hamilton	Dale	Best stallion, suckling	$5
Robt. Welch	Kit	Mare, three years old and upwards	$20
Chas. Luce	Lucy	Mare, two years old	$15
J. P. Dudley	Lady Allen	Mare, one year old	$10
Wm. Hamilton	Young Winona	Suckling filly	$5
		Jacks and Jennets.	
John Cooney	Black Maria	Best jennet	$1
		Mules.	
C. H. Worthington	Jennie and Jack	Pair of mules, owned by one man	$10
		Roadsters.	
Wm. A. Mathews	G. M. Patchen, Jr.	Stallion, four years old and over.	$30
Wm. Hamilton	Honest Allen	Stallion, three years old	$20
Wm. Hamilton	Fannie	Mare, four years old and over	$20
Geo. W. Wilson	Bell Patchen	Mare, three years old	$15
		California draft horses.	
Thomas Blake	John Barnes	Stallion, three years old and over.	$30
J. P. Dudley	Billy	Stallion, two years old	$20
A. M. Story	Kate	Mare, three years old and over	$20
T. Andrews	Lady Washington	Mare, two years old	$15
T. Andrews	Sallie Washington	Suckling filly	$5
Geo. W. Wilson	Sam. and Mollie	Span draft horses, in harness	$20
Thomas Blake	Capt. Thompson	Imported draft stallion, three years old and over	$30

Exhibitor.	Name.	Animal.	Premium.
		Carriage horses.	
John Barry	Jackson and Mate.	Span of carriage horses, owned and used as such by one man.	$20
		Sweepstakes.	
J. D. Carr	Carr's Mambrino	Stallion, of any breed or age	$30
Wm. Boots	Miami	Mare, of any breed or age	$20
		Graded horses.	
G. K. Hostetter	El Capitan	Stallion, one year old	$10
Wm. Hamilton	Santa Clara	Mare, four years old and over, with colt	$10
E. A. Kennedy	Princess	Mare, two years old	$10
		Durham cattle.	
Colonel Younger	Thorndale	Best bull, four years old and over.	$30
C. B. Polhemus	Phil. Sheridan	Best bull, three years old	$20
Colonel Younger	Moonlight	Best bull, two years old	$15
Jones & Co	Mason Duke	Best bull, one year old	$10
Wm. Quinn	Duke of San José.	Best bull suckling calf	$5
Carr & Chapman	Lady Solway	Best cow, four years old and over.	$20
Jones & Co	Lorena	Best cow, three years old.	$15
Jones & Co	Caroline	Best cow, two years old	$15
Colonel Younger	Forest Rose	Best cow, one year old	$10
Colonel Younger	Rosa Nell	Best heifer calf	$5
		Devon cattle.	
Thomas Blake	Devonshire Billy	Best imported bull, three years old and over	$20
		Alderneys.	
C. B. Polhemus	Prince John	Best bull, three years old and over	$15
John Cooney	Yankee	Best bull, two years old	$10
C. B. Polhemus	Princess Royal	Best cow, three years and over.	$15
C. B. Polhemus	Princess Louise	Best cow, two years old	$10
C. B. Polhemus	Beatrice	Best cow, one year old	$5
		Sweepstakes.	
Jones & Co	Mason Duke	Best bull, of any breed or age	$30
Colonel Younger	Sprightly	Best cow, of any breed or age	$20
		Dairy cow.	
Wm. Quinn	Alice	Best dairy cow	$20
		Swine.	
R. S. Thomson	Young Comet	Best boar, of any breed or age.	$10
R. S. Thomson	Beatrice	Best sow, of any breed or age	$5
J. C. Mills		Best pair of pigs	$5

POULTRY.

Exhibitor.	Animal.	Premium.
J. C. Mills	Best pair of Narragansett turkeys	$3
Freddie Collins	Best trio Partridge Cochins	$3
Freddie Collins	Best trio Brown Leghorns	$3
Freddie Collins	Best trio White Cochins	$3
Freddie Collins	Best pair Rouen ducks	$3
Freddie Collins	Best trio Houdans	$3
B. T. Watkins	Best Black-breasted Game Bantams	$3
B. T. Watkins	Best pair White Leghorns	$3
B. T. Watkins	Best pair Silver-spangled Hamburgs	$3
B. T. Watkins	Best pair Ailsburg ducks	$3
C. H. Worthington	Best pair Bronze turkeys	$3
Mrs. M. H. Weldore	Best trio White Crested Polands	$3
J. H. Cockendall	Best one coop of seven chicks, Buff Cochins, six months old	$3
J. H. Cockendall	Best coop of nine chicks, Buff Cochins, three months old	$3
James Vinsonhaler	Best pair Holland turkeys	$3
James Vinsonhaler	Best pair Golden-breasted Polands	$3
Theo. Lenzen	Best pair Light Bramahs	$3

GRADED CATTLE.

Exhibitor.	Name.	Animal.	Premium.
Wm. Quinn	Frederica	Best cow, three years old and over	$15
Wm. Quinn	May Queen	Best cow, two years old and over.	$10
Chas. Clark	Mollie 1st	Best cow, one year old and over	$5

HERD OF CATTLE.

Exhibitor.	Name.	Animal.	Premium.
Colonel Younger		Best herd of cattle—five entries	$30

CASHMERE OR ANGORA GOATS.

Exhibitor.	Name.	Animal.	Premium.
Lewis & McCracken..	Prince of Pine Mountain	Best thoroughbred buck—California raised.....	..... $10
C. P. Bailey.....	Queen of Monterey	Best thoroughbred ewe—California raised.....	..... $10
H. Gilmore.....	.....	Best herd of ten goats—California raised.....	..... $10

SHEEP.

Exhibitor.	Name.	Animal.	Premium.
B. T. Watkins.....	Eugene T. Sawyer.	Best Spanish merino buck.....	..... $10
B. T. Watkins.....	Walley	Best Spanish merino ewe.....	..... $10
B. T. Watkins.....	.....	Best pen of three ram lambs.....	..... $10
B. T. Watkins.....	.....	Best pen of five ewe lambs.....	..... $10
E. A. Kennedy.....	No name.....	Best French merino buck.....	..... $10
E. A. Kennedy.....	No name.....	Best French merino ewe.....	..... $10
E. A. Kennedy.....	.....	Best three ram lambs.....	..... $10
E. A. Kennedy.....	.....	Best five ewe lambs.....	..... $10
Lewis & McCracken..	Pajaro	Best Cotswold buck.....	..... $10
Jesse D. Carr.....	Lord Leicestershire	Best Leicestershire buck.....	..... $10
Jesse D. Carr.....	No name.....	Best Southdown buck.....	..... $10
Lewis & McCracken..	May	Best Cotswold ewe	..... $10
Jesse D. Carr.....	No name.....	Best Southdown ewe.....	..... $10
Lewis & McCracken..	.....	Best three ram lambs—Cotswold	..... $10
Jesse D. Carr.....	.....	Best three ram lambs—Southdown.....	..... $10
Lewis & McCracken..	.....	Best five ewe lambs—Cotswold.	..... $10
Jesse D. Carr.....	.....	Best five ewe lambs—Southdown	..... $10

SWEEPSTAKES—SHEEP.

Exhibitor.	Name.	Animal.	Premium.
B. T. Watkins.....	Eugene T. Sawyer.	Best ram for all purposes.....	..... $10
Lewis & McCracken..	May	Best ewe for all purposes.....	..... $10

Some of the articles exhibited deserve more than a passing mention. Among them are the following:

PLANTS AND FLOWERS.

Mr. L. F. Sanderson exhibited a large and choice variety of plants and flowers, shrubs, and cut plants, among which were many rare specimens. Mr. John Rock also sustained his reputation as a florist, by a magnificent exhibition of flowers, shrubs, and ornamental plants, which this gentleman has secured at a great expense, and has certainly been to a vast deal of trouble.

SADDLERY AND HARNESS-WORK.

The only exhibitor in this line was Mr. H. Messing, of San José. The display was very large, and the work perfect.

TANNED LEATHER.

Mr. Eberhardt, of Santa Clara, was the only exhibitor in this department. The work of this gentleman is so widely known throughout the State, and so universally admired, that a minute description is unnecessary.

NEEDLE AND FANCY WORK.

In this department the entries were numerous and varied. Among them were specially noticeable, tatting, by Mrs. A. C. Armstrong; a suit of child's clothes, by Miss M. D. McChain; embroidery and chenille work, by Mrs. W. C. Wilson. The display of Mrs. Jackson Lewis, though not entered for a premium, was thought by the committee especially worthy in its variety as well as its exquisite taste.

FARM AND GARDEN PRODUCTS.

The display in this department was much larger, and in every way much superior, than at any previous exhibition. A magnificent display of all kinds of vegetables was made.

GRAPES AND PEACHES.

The competitors in this department were Mr. D. M. Harwood, of the Lone Hill Vineyard, and Mr. S. P. Stockton. Their display excelled in every way anything ever exhibited in this line at any previous Fair. The collection of peaches, by Mr. John Rock, could not be beaten by any one. The fruit exhibited by Mr. Burrell was made special note of.

THE STOCK YARDS.

The entries of stock were far more numerous than at any previous Fair; so much so that it was with the utmost difficulty that the society

could prepare the additional stalls required by the demands of the exhibitors.

HORSES.

In this department the animals were of the finest quality, showing the blood prominently. Mr. R. T. O'Hanlon, of San José, exhibited his fine thoroughbred mare "Alpha;" Wm. A. Mathews' stallion "George M. Patchen, Jr.," with six of his colts; also, Wm. Hamilton's celebrated stallion "Ethan Allen, Jr.," with a family of six of his colts.

DURHAM CATTLE.

In this department the contests for the society's premiums were more spirited than at any previous exhibition.

ALDERNEYS.

The people of this locality have a penchant for Durhams, and Alderneys are but little bred; but those entered by Mr. C. B. Polhemus and Mr. John Cooney, showed that great care had been taken to select and raise none but the purest and finest breeds in the country.

ANGORA GOATS.

This department was represented by Messrs. Lewis & McCracken, J. P. Sargent, and H. Gilmore, from Napa County. Their herds were very choice, and the gentlemen themselves very enthusiastic in their line.

FARMS.

This being a new feature in our premium list, not many competitors entered; but among those who entered, are the following gentlemen: A. M. Ogier, whose farm is situated on the west side of the Alviso and San José road. Great care has been taken to improve this farm, by Mr. Ogier. W. W. Montague, who lives just below Mr. Ogier, has certainly one of the finest improved and best cultivated farms in the valley; and the gentleman deserves great credit for the way in which his farm is kept. Wm. Boots, who lives near Mr. Montague, has also a finely improved and well cultivated farm. Mr. W. A. Z. Edwards, a gentleman who for years has devoted his time to farming, has been duly rewarded in his farm, situated about three and a half miles from this city, on the old Alviso Turnpike.

NURSERIES.

This branch is not very extensively followed, as yet, in this valley, but among those who entered are John Rock, who certainly has one of the finest nurseries in the State—almost every kind of plant, shrub, tree, and flower can be seen at his nursery; Mr. Newhall also has a fine nursery, well cultivated, and comprises the choicest varieties of trees to be found in any part of the valley.

VARIOUS MATTERS.

Since our last annual report, the society has spent much time and money in beautifying and improving their grounds on the Alameda, and in time hope to make them the most convenient and attractive of any in the State; and the society hopes that at their next exhibition it will have the hearty coöperation of all classes of people in the work of productive improvement to which it is devoted.

Respectfully submitted.

D. J. PORTER, Secretary.

By E. K. CAMPBELL,
Assistant Secretary, Santa Clara Valley Agricultural Society.

TRANSACTIONS

OF

The San Joaquin Valley District Agricultural Society,

FOR

THE YEAR 1874.

OFFICERS OF THE SOCIETY.

[Elected December 5th, 1874, for the ensuing year.]

PRESIDENT.....L. U. SHIPPEE.

VICE PRESIDENTS.

C. E. NEEDHAM.....San Joaquin County.
FRED. ARNOLD.....Stockton.

SECRETARY.

H. W. WEAVER.....Stockton.

TREASURER.

T. S. HINDS.....Stockton.

DIRECTORS.

CAPTAIN I. W. SMITH.....Stockton.
CORNELIUS SWAIN.....San Joaquin County.

REPORT.

The Board of Managers of the San Joaquin Valley District Agricultural Society respectfully submit the following, their annual report for the year one thousand eight hundred and seventy-four.

The year has been a prosperous one to the society. The following will show the condition of the finances and the prosperity of the society.

FINANCIAL REPORT.

The following is a statement of the receipts and expenditures for the year.

Item.	Amount.
Receipts.	
Balance in the treasury December 6th, 1873, as per report..	$345 73
Collection from sureties of lessee of track for the year 1873	500 00
Season tickets sold	2,360 00
Single tickets sold	3,454 35
Life memberships	50 00
Entries to races	1,001 00
Privileges at track and hall	1,711 25
Receipts for admission to grand stand	272 05
Quarter stretch badges sold at track	124 50
Subscriptions for building new track and stand	4,128 00
Subscriptions for special premiums	20 00
Subscriptions for special race October 3d	177 50
Hay sold	41 25
Total receipts	$14,185 63
Expenditures.	
Balance due for the year 1873, as per last report	$148 53
Permanent improvements in building of a new stand for spectators, a new race track, new stalls, and repairs on stalls, etc	7,688 62
General expenses, including rent of hall, music, gas and gas-fitting, salaries, wages of employés, labor, decorations, printing, advertising, etc	3,089 26
Premiums, including trials of speed	2,944 50
Entrance money to races refunded	65 00
Total expenditures	$13,935 91
Balance in hands of Treasurer	249 72
Total	$14,185 63

FINANCIAL CONDITION OF THE SOCIETY.

Item.		Amount.
Assets.		
Balance in hands of Treasurer		$249 72
Subscriptions unpaid, but reliable		85 00
Due by Central Pacific Railroad Co. for return freight		12 75
Total		$347 47
Liabilities.		
State and county taxes	$105 00	
Premiums not called for	72 00	
		177 00
Leaving a surplus of		$170 47

The following named exhibitors have generously donated the premiums awarded to them, viz:

Exhibitor.	Amount.
Messrs. George West & Co., on wines	$35 00
R. B. Lane, on flour, etc	8 00
Mr. H. Brooks, on poultry	3 00
F. S. Hatch, on horse shoes	5 00

PREMIUMS AWARDED.

FIRST DEPARTMENT.

CLASS I—THOROUGHBRED HORSES.

Exhibitor.	Residence.	Animal.	Premium.
Isaac Laswell.....	San Joaquin County.	Best stallion, three years old and upwards—b. s. Hardwood, by Woodburn, four years old.....	.....$20
Col. Caleb Dorsey.	Stanislaus County.....	Second best stallion—c. s. s. Spectre, five years old.....	Framed dip.
Barnes Potter.....	Stanislaus County.....	Best mare, three years old and upwards—b. m. Farmer's Maid, five years old.....	.....$15

CLASS II—FAMILIES.

Exhibitor.	Residence.	Animal.	Premium.
H. Heuston.....	San Joaquin County.	Best mare for all purposes, with family of four or more colts—ch. s. m. Chestnut Bird, eight years old, with four colts.....	.....$10
J. A. McCloud.....	San Joaquin County.	Best roadster mare, with family of four or more colts—b. m. Beauty, twenty years old, with seven colts.....	.....$10
W. R. Leadbetter..	....	Best mare, for draft or farm purposes—b. m. Kitty Overhiser, and five colts.....	.....$10

CLASS III—HORSES FOR ALL PURPOSES.

Exhibitor.	Residence.	Animal.	Premium.
L. U. Shippee	Stockton	Best stallion, three years old and upwards—b. s. Bay Colt, by David Hill, six years old	$20
Joseph Heintze	Stockton	Best stallion, two years old—s. c. Phil.Sheridan, by David Hill	$10
C. M. Creaner	Stockton	Best sucking colt	$5
Beardsley & Fee	Stockton	Best mare, three years old and upwards—s. m. Lady Lovell, by a Messenger horse, five years old	$15
L. U. Shippee	Stockton	Best mare, two years old—b. f. Kate M	$10

CLASS IV—ROADSTERS.

Exhibitor.	Residence.	Animal.	Premium.
W. D. Ashley	Stockton	Best stallion, four years old and upwards—br. s. Bismarck, by David Hill, five years old	$20
Chas. H. Sisson	Stockton	Best stallion, three years old—s. c. Fox, by Blackhawk	$10
Lewis Hewlett		Stallion, two years old—b. c. Dinks Holden, by Chieftain.	Sp. prem.dip.
Uriah Martin		Stallion, one year old—b. c. Young America, by Chieftain	Sp. prem.dip.
J. A. McCloud	Stockton	Best mare, three years old—Berkshire Girl	$10

CLASS V—CALIFORNIA DRAFT HORSES.

Exhibitor.	Residence.	Animal.	Premium.
Beardsley & Fee	Stockton	Best stallion, three years old and upwards—b. s. Ontario, by Chieftain, six years old	$20
H. Heuston	San Joaquin County.	Second best stallion—b. s. Monarch, by Prince Consort, four years old	Framed dip.
H. Heuston	San Joaquin County.	Best one year old—horse colt Scotchman, by Monarch	$10
H. Heuston	San Joaquin County.	Best sucking colt—Heavy Set, by Monarch	$5
H. Heuston	San Joaquin County.	Best mare, four years old and upwards—ch. m. Chestnut Bird, eight years old	$10

CLASS VI—CARRIAGE HORSES.

Exhibitor.	Residence.	Animal.	Premium.
J. A. McCloud.....	.....	Best single buggy horse—b. h. Silver Thorn, by Chieftain.....	.....$5

CLASS VII—GRADED HORSES.

Exhibitor.	Residence.	Animal.	Premium.
Wm. Johnson.....	Stanislaus County.....	Best stallion, three years old and upwards—b. s. Sam Houston, by Solomon, four years old.....	.....$10
L. U. Shippee.....	Stockton.....	Best stallion, two years old—b. c. Major Kent, by General McClellan, dam Belmont.....	.....$5
C. M. Creaner.....	.....	Best mare, four years old and over, with colt—s. m. Julia and colt.....	.....$10
J. A. McCloud.....	Stockton.....	Best mare, two years old—s. m. Pet.....	.....

SWEEPSTAKES.

Exhibitor.	Residence.	Animal.	Premium.
L. U. Shippee.....	Stockton.....	Best stallion—b. s. Bay Colt, six years old, by David Hill...	.....$20
L. U. Shippee.....	Stockton.....	Best mare—s. m. Flora, by David Hill, three years old.....	.....$10

CLASS VIII—JACKS.

Exhibitor.	Residence.	Animal.	Premium.
Jeff. Bridgford.....	.....	Best jack, Mameluke, four years old.....	.....$5

CLASS IX—MULES.

Exhibitor.	Residence.	Animal.	Premium.
L. U. Shippee.		Best pair of mules owned by one man—span of black mules	$10

CLASS X—DURHAM CATTLE.

Exhibitor.	Residence.	Animal.	Premium.
Jeff. Bridgford		Best bull, three years old and upwards—Gold Dust	$20
Col. C. Younger	Santa Clara County.	Best bull, two years old—Moonlight	$10
Cyrus Jones & Co.	San José	Best bull, one year old—Mason Duke	$5
W. L. Overhiser	San Joaquin County.	Best bull calf—Twenty-second Grand Turk of Oak Home	Framed dipl.
Cyrus Jones & Co.	San José	Best cow, three years old and upwards—Geraldine	$15
Cyrus Jones & Co.	San José	Best cow, two years old—Caroline	$10
Cyrus Jones & Co.	San José	Best heifer, one year old—Lady Hughes	$5
Jeff. Bridgford		Best heifer calf—Goodnew 2d	$4

CLASS XII—JERSEY CATTLE.

Exhibitor.	Residence.	Animal.	Premium.
L. J. Orcutt		Best cow, three years old and upwards—Blanche	$5

CLASS XIII—HOLSTEIN CATTLE.

Exhibitor.	Residence.	Animal.	Premium.
Charles Clark	San José	Best bull, three years old and upwards—Oppedose	$10

CLASS XVI—GRADED CATTLE.

Exhibitor.	Residence.	Animal.	Premium.
S. B. Kingsley		Best bull, three years old and upwards—Herman, by Blanco.	$10
Charles Clark	San José	Best cow, three years old and upwards—Molly	$10
Charles Clark		Best heifer, one year old—Molly First	$5

CLASS XVII—HERDS.

Exhibitor.	Residence.	Animal.	Premium.
Cyrus Jones & Co.	San José	Best herd	$20

The committee most earnestly recommend a special premium to Colonel Younger, of Santa Clara County, for the herd exhibited by him.

SWEEPSTAKES.

Exhibitor.	Residence.	Animal.	Premium.
Cyrus Jones	San José	Best bull, one year old—Mason Duke	$20
Col. C. Younger	Santa Clara County.	Best cow, six years old—Sprightly	$10

CLASS XVIII—GOATS.

Exhibitor.	Residence.	Animal.	Premium.
M. Gilmore	El Dorado County.	Best thoroughbred buck—Hannibal	$5
M. Gilmore	El Dorado County.	Best ewe	$5
M. Gilmore	El Dorado County.	Best herd of ten	$5

CLASS XIX—SHEEP—SPANISH MERINO.

Exhibitor.	Residence.	Animal.	Premium.
L. U. Shippee	Stockton	Best ram, two years old and upwards—Colonel Fremont	$10
L. U. Shippee	Stockton	Second best ram—Col. Moore	Framed dipl.
L. U. Shippee	Stockton	Best ram, one year old and under two—Pride of Vermont	$10
L. U. Shippee	Stockton	Second best ram—Commodore	Framed dipl.
L. U. Shippee	Stockton	Best pen of ewes, two years old and upwards	$10
L. U. Shippee	Stockton	Best pen of ewes, one year old and under two	$10
L. U. Shippee	Stockton	Best pen of five ewe lambs	$5
L. U. Shippee	Stockton	Best ram and five of his lambs—Colonel Fremont	$15

Special premiums recommended by the committee, to Thomas A. Wilson and W. D. Ashley, for lambs exhibited by them.

FRENCH MERINO.

Exhibitor.	Residence.	Animal.	Premium.
William Blacow	Alameda County	Best ram, two years old and upwards—Garnester	$10
William Blacow	Alameda County	Best pen of five ewes	$5

LEICESTERSHIRE.

Exhibitor.	Residence.	Animal.	Premium.
Jesse D. Carr	Gabilan	Best ram, two years old and upwards—Lord Leicestershire	$10

SOUTHDOWNS.

Exhibitor.	Residence.	Animal.	Premium.
J. D. Carr	Gabilan	Best ram, two years old and upwards	$10
J. D. Carr	Gabilan	Best pen of five ewes	$5

GRADES.

Exhibitor.	Residence.	Animal.	Premium.
W. D. Ashley.....	San Joaquin County..	Best pen of five lambs.....	.....$5

SWEEPSTAKES.

Exhibitor.	Residence.	Animal.	Premium.
L. U. Shippee.....	Stockton.....	Best ram, Colonel Ellsworth.....	.....$10
L. U. Shippee.....	Stockton.....	Best ewe, Nellie.....	.....$5

NOTE.—The Board of Managers acknowledge their obligations and tender their thanks to James Sessions, Esq., of Oakland, for the exhibition of his celebrated trotting mare Oakland Maid, and his Hambletonian stallion Ulster Chief; also, to William Mathews, Esq., of San José, for exhibit of his fine trotting stallion George M. Patchen, Jr., the performances of speed of which animals on the track was one of the most attractive and interesting features of the exhibition. A framed diploma is hereby awarded to each of the above named gentlemen.

CLASS XXI—POULTRY.

Exhibitor.	Residence.	Animal.	Premium.
John E. Moore.....	Stockton.....	Best Polands, coop of Golden Spangled.....	.....$3
P. T. Brown.....	Stockton.....	Best Dark Brahmas.....	.....$3
P. T. Brown.....	Stockton.....	Best Cochins, coop of Partridge.	.....$3
P. T. Brown.....	Stockton.....	Best Houdans.....	.....$3
H. Brock.....	Stockton.....	Best White Leghorns.....	.....$3
P. T. Brown.....	Stockton.....	Best Silver Spang'd Hamburgs.	.....$3
P. T. Brown.....	Stockton.....	Best exhibit of Bantams.....	.....$3
P. T. Brown.....	Stockton.....	Best exhibit, comprising the greatest number of the different breeds.....	.....$5
Stewart & Derrick.	.....	Best lot of turkeys, coop of the Bronze variety.....	.....$3
Walter F. Baggs...	Stockton.....	Best exhibit of rabbits.....	.....$3

SECOND DEPARTMENT.

CLASS I—FARMS, ORCHARDS, VINEYARDS.

Exhibitor.	Article.	Premium.
G. C. Holman	Best bale of hops	$5
Mrs. M. W. Rhodes	Best fifty pounds of wheat; sack of White Chili, sample of one hundred and forty tons	$3

Special premium recommended to Joseph Putnam, San Joaquin County. Special mention of watermelons and squashes exhibited by the same person. Also, of one sack of Excelsior wheat, and one sack of Early Rose potatoes, exhibited by Dr. R. K. Reed; and of samples of Early Rose potatoes, volunteer corn, beans, squashes, and pumpkins, exhibited by Thomas Walls, raised on their farms near Linden. Two mammoth watermelons, exhibited by Thomas Barnes, from his fruit store on Main street, deserve special notice.

CLASS II—VEGETABLES.

Exhibitor.	Article.	Premium.
Thomas J. Murray	Best display of vegetables raised on one ranch, and exhibited by the producer	$5
Brown & Co	Exhibited a fine collection of vegetables, which deserve special mention	

CLASS III—BRANDY AND WINE.

Exhibitor.	Article.	Premium.
C. Detton	Best white wine, vintage of 1870	$5
C. Detton	Best white wine, vintage of 1871	$5
C. Detton	Best white wine, vintage of 1872	$5
George West	Best red wine, vintage of 1872	$5
George West	Best Angelica, vintage of 1871	$5
George West	Best Angelica, vintage of 1872	$5
George West	Best Frontignan, vintage of 1872	$5
George West	Best Sherry, vintage of 1867	$5
George West	Best Reisling, vintage of 1871	$5
George West	Best brandy, vintage 1867, "El Pinal" brand	$5
Powers & Henderson, agents, Sacramento.	For a splendid collection of bitters and tonics, a diploma of the society is recommended	

The manufacture of wines is now one of the most important industries of the State. It has been demonstrated for years that the climate and soil are not excelled anywhere in the world for the growth of the best varieties of wine-producing grapes. It only requires

capital, skill, and experience to compete with the great wine markets of Europe. The Sherry of George West, etc., is not excelled by the famous Duff Gordon, or any other brand. The dry white wines of Mr. Detton, and of Mr. West, also, are more palatable, and possess a richer flavor than the same class of Rhine wines. The Madeira, Reisling, Frontignac, and Angelica, are all good of their class. According to the taste and judgment of your committee, the entire list of wines which we have examined are too sweet. They contain too much saccharine matter, which can easily be corrected by the skill of the manufacturers, which we recommend should be done.

R. K. REID, M. D.,
I. S. TITUS, M. D.,
H. B. PLATT,
M. DE BLAINVILLE.

CLASS IV—HORTICULTURAL.

Exhibitor.	Article.	Premium.
Joseph Putnam	Best collection of apples in the district	$10
Peter N. Young	Second best collection of apples	$5
G. C. Holman	Best five varieties of apples or over	Framed diploma.
George West	Best collection of pears in the district	$5
P. N. Young	Second best collection of pears	$3
William Kuhl	Best five varieties of pears, five each	$3
P. N. Young	Best twelve varieties of quinces	$3
Mrs. Dr. Reid	Second best varieties of quinces	$2
Geo. West	Best collection of grapes	$10
P. N. Young	Second best collection of grapes	$5
Joseph Putnam	Third best collection of grapes	$3
Geo. West	Best five varieties of grapes	$5
Peter Young	Second best five varieties of grapes	$3
Geo. West	Best single variety of grapes	$2
Geo. West	Best eight bunches raisin grapes	$3
Thos. Murray	Best collection of figs	$3
Robert Reid	Second best collection of figs	$2
Mrs. R. K. Reid	Best six specimens of pomegranates	$3
Mrs. Jos. Hale	Best gooseberries, preserved in spirits	$2
Mrs. Jos. Hale	Best peaches, preserved in spirits	$2
Mrs. Jos. Hale	Best plums, preserved in spirits	$2
Mrs. Jos. Hale	Best blackberries, preserved in spirits	$2
Mrs. Jos. Hale	Best cherries, preserved in spirits	$2
Mrs. Jos. Hale	Best grapes, preserved in spirits	$2
Mrs. Jos. Hale	Largest and best exhibit preserves in sugar	$5
Mrs. J. C. Reid	Second best exhibit preserves in sugar	$3
Mrs. J. C. Reid	Best quinces, preserved in sugar	$2
Mrs. Jos. Hale	Best plums, preserved in sugar	$2
Mrs. Jos. Hale	Best crab apples, preserved in sugar	$2
Mrs. J. C. Reid	Best pears, preserved in sugar	$2
Mrs. Jos. Hale	Best peaches, preserved in sugar	$2
Mrs. Jos. Hale	Best apricots, preserved in sugar	$2
Mrs. Jos. Hale	Best apricot jelly	$2
Mrs. J. C. Reid	Best crab apple jelly	$2
Mrs. Jos. Hale	Best grape jelly	$2
Mrs. J. C. Reid	Best plum jelly	$2
Mrs. J. C. Reid	Best quince jelly	$2
Mrs. Jos. Hale	Best currant jelly	$2
Mrs. J. C. Reid	Best blackberry jelly	$2
Mrs. Jos. Hale	Best pickled cucumbers	$2
Mrs. Jos. Hale	Best pickled tomatoes	$2
Mrs. J. C. Reid	Best pickled pears	$2
Mrs. Jos. Hale	Best mixed pickles	$2
Mrs. J. C. Reid	Best pickled figs	$2
Mrs. J. C. Reid	Best box of dried figs	$3
Mrs. Uriah Martin	Best box of raisins	$3

CLASS VI—HOME-MADE BREAD.

Exhibitor.	Article.	Premium.
Mrs. Austin Sperry....	Best home-made bread.....	.....$2
Mrs. Austin Sperry....	Best home-made brown bread.....	.....$2
Miss Bessie Reid, under sixteen years..	Best two loaves.....	.....$2
.....	Special premium offered by J. P. Spooner for best loaf of bread made by a young miss under eighteen years, awarded to Miss Florence Bugbee.....	.....Photograph, $10
.....	Special premium offered by W. J. Belding, dealer in dry goods, El Dorado street, awarded to Mrs. S. W. Sperry for two loaves Graham bread.....	.....$5

CLASS VII—DOMESTIC MANUFACTURES.

Exhibitor.	Article.	Premium.
Lutje & Gross.....	Best ten pounds confectionery.....	.....$5
R. B. Lane, Stockton.	Best wheat flour.....	.....$5
R. B. Lane, Stockton.	Best corn meal.....	.....$3

The committee on silk and other fabrics recommend a special premium to Joseph Green, for exhibit of silk ribbons produced at his factory in Oakland, which in point of quality and variety of shades, compare favorably with imported goods of the same character.

THIRD DEPARTMENT.

MACHINERY, IMPLEMENTS, NEEDLEWORK, ETC.

CLASS I—AGRICULTURAL IMPLEMENTS.

Exhibitor.	Article.	Premium.
Grange Union	Best display of agricultural implements	$10
H. C. Shaw	Best thrashing machine — Pitts' Gold Medal Machine	$10
Matteson & Williamson	Best header	$10
Grange Union	Best self-raking reaper	$5
Grange Union	Best mowing machine—Champion Mower	$5
Grange Union	Best broadcast seed sower—Gan patent, April 2, 1867, and January 2, 1872	$5
D. T. Gillis	Best harrow	$3
Grange Union	Best straw cutter—Hocking & Co	$3
Kimball & Co	Best hay press—Eagle	Framed diploma.
Matteson & Williamson	Best horse fork	$5
John Hart	Best grain lifter	$5
Grange Union	Best separator—Nash & Cutts'	Framed diploma.
H. C. Shaw	Best cultivator	$5
Grange Union	Best plow—Eureka	$5
	Moline plow	Special mention.
H. C. Shaw	Best gang of four 8-inch plows, with seed sower attached	$5
Matteson & Williamson	Best single steel plow	$5

CLASS II—WHEELWRIGHT WORK.

Exhibitor.	Article.	Premium.
Rodman & Braids, Stockton	Two two-seated family wagons	$5

These were the only wagons manufactured in this district.

Special premium recommended to Harry Bernard, of Sacramento, for splendid display of carriages, consisting of one family carriage, three top-buggies, one open buggy, and a skeleton wagon—all of superior style and finish; framed diploma.

Special premiums are recommended to the following:

Three spring wagons, Sweepstakes, manufactured at San Lorenzo.

One four-horse iron-axle Bain wagon, and one four-horse thimbleskein wagon, exhibited by H. C. Shaw, agent.

One six-horse wagon, manufactured by P. S. Schutzler, Chicago, exhibited by H. C. Shaw, agent.

Studebaker spring and four-horse wagons, exhibited by H. C. Shaw, agent.

One Mitchell four-horse wagon, exhibited by Grange Union.

One two-horse wagon, manufactured by Wm. Harrison, Grand Rapids, Michigan, exhibited by C. G. Ives, agent.

CLASS III—HARNESS AND LEATHER.

Exhibitor.	Article.	Premium.
H. T. Dorrance, of Stockton	Best display of saddlery and harness	$5
H. T. Dorrance, of Stockton	Best set of carriage harness	$5
H. T. Dorrance, of Stockton	Best single harness	$5
H. T. Dorrance, of Stockton	Best saddle	$5
H. T. Dorrance, of Stockton	Best lady's saddle	$5
H. T. Dorrance, of Stockton	Best bridle	$3
C. Kinderman	Best half dozen calf skins	Diploma.
C. Kinderman	Best side of upper leather	Diploma.

Special premium recommended to J. H. Andrews, for two horse collars.

CLASS IV—MACHINERY AND BLACKSMITH WORK.

Exhibitor.	Article.	Premium.
M. C. Hawley & Co., Agents	One steam engine, made by Gan, Scott & Co., Richmond, Indiana	Special mention.
Hatch & Holmes	Best horse shoes	$5

CLASS VI—CABINET WARE.

Exhibitor.	Article.	Premium.
Frank Bros., Stockton	Best dressing bureau	$5
Frank Bros., Stockton	Best sofa	$5
Frank Bros., Stockton	Best lounge	$3
Frank Bros., Stockton	Best set of parlor chairs	$5
Frank Bros., Stockton	Best center table	$3
Frank Bros., Stockton	Best set of parlor furniture	$5
Frank Bros., Stockton	Best display of furniture	$5
Frank Bros., Stockton	Best set of bedroom furniture	$5
Frank Bros., Stockton	Best display of upholstery	$5
Ellsworth & Washburn, Stockton	Best school furniture	$5

CLASS VII—MISCELLANEOUS.

Exhibitor.	Article.	Premium.
Ruhl & Meiries, of Stockton	Best display of tinware	Framed diploma.
Ruhl & Meiries, of Stockton	Best display of stoves	$5
Kennedy & Miller	Vapor cooking and heating stoves	Special mention.
C. N. Payson	Best exhibit of stair posts and building material	$5
Ellsworth & Washburn	Exhibit of stair posts made from trees grown in Court House Square	Special mention.
W. H. Van Vlear, of Stockton	Best display of firearms	$5
Charleson & Morris, of Stockton	Best display of boots and shoes	$5
Wheeler & Wilson	Best sewing machine for family use	Framed diploma.
Wheeler & Wilson	Best and greatest variety of work done by any sewing machine	Framed diploma.

CLASS VIII—NEEDLE AND FANCY WORK.

Exhibitor.	Article.	Premium.
Mrs. Frank Stewart	Best display of ladies' and children's clothing	$10
Mrs. R. S. Ellsworth	Best hand-made shirt	$3
Mrs. Robinson	Fine display of shirts	Special notice.
Mrs. Welch	Fine display of shirts, a lady sixty-seven years of age	Special notice.
Mrs. Wm. S. Smith	Best display of knitting	$3
Mrs. Dr. Stockton	Fine display	Special notice.
Mrs. Batchelder	Fine display	Special notice.
Mrs. John Bird	Best worked quilt	$2
Mrs. Spear	Best silk quilt	$2
Mrs. N. B. Jenks	Best patchwork quilt	$2
Miss Amy Kelsey	Best child's afghan	$2
Miss Bessie Reid	Meritorious piece of work	Special notice.
Mrs. Rebecca Brown	Two quilts	Special notice.
Mrs. Dr. Stockton	Fine specimens of work	Special notice.
Mrs. Titus	Fine specimens of work	Special notice.
Mrs. C. J. Smith	Best display of crochet work	$3
Mrs. J. A. McDougald	Best crochet tidy	$2
Miss Mary Allen	Best embroidered child's dress	$2
Mrs. Dr. Stockton	Best Chinese silk embroidery	$2
Mrs. Dr. Myers	Best sofa pillow	$2
Mrs. Alton M. Stowe	Best tatting collar	$2
Mrs. A. G. Brown	Best home embroidery	$2
Miss M. A. Ingalls	Best bead work	$2
Mrs. F. Robinson	Best home-made rug	$2
Mrs. Dr. Stockton	Best afghan	$2
Miss Louisa Garry	Best embroidered picture	$2
Mrs. Dr. Stockton	Best child's dress, made by a lady sixty years of age, specimen of hand-sewing	Special notice.

CLASS VIII—NEEDLE AND FANCY WORK—Continued.

Exhibitor.	Article.	Premium.
Miss Clara Fanning...	Best phantom leaves	$2
Miss Clara Fanning...	Best Autumn leaves	$2
Miss A. A. Cory.....	Best pressed flowers	$2
Mrs. M. J. Ingalls.....	Best feather flowers	$2
Mrs. J. H. O'Brien ...	Best moss work	$2
Mrs. J. H. O'Brien ...	Best exhibit of wax work	$2
Miss A. A. Cory..	Best hair work	$2
Miss H. Baldwin.....	Best fancy work	$2
Mrs. F. Robinson.....	Best braid work	$2
Mrs. Joseph Hale.....	Best bouquet of native grasses	$2
Miss Bessie Reid	Best quilt by miss under sixteen	$2
Miss Bessie Reid.....	Best stocking darning	$2

FOURTH DEPARTMENT.

(FOR THE ENCOURAGEMENT OF THE YOUNG PEOPLE—BOYS AND MISSES UNDER EIGHTEEN YEARS.)

PENMANSHIP.

Exhibitor.	Article.	Premium.
Thos. Loutitt (Washington High School)	Best specimen of penmanship	$2
Weber, First Grade...	Penmanship	Framed diploma.
Katie Pool (Weber, First Grade).....	Best single specimen of penmanship	Gold pen and case.
Jefferson, Sec'd Grade	Penmanship	Framed diploma.
Ralph P. Lane (Washington, Sec'd Grade)	Best single specimen of penmanship	Gold pen and case.
Addie Hamlet (Franklin, Second Grade)..	Specimen of penmanship	Special notice.
Jefferson, Th'd Grade	Penmanship	Framed diploma.
Wm. Murphy (Jefferson, Third Grade)...	Best single specimen of penmanship	Gold pen and case.
M. K. Lovejoy (Washington, Th'd Grade)	Specimen of penmanship	Special notice.
Viney'd, Fourth G'de.	Penmanship	Framed diploma.
Emma Rowden (Vineyard, Fourth Grade)	Best single specimen of penmanship	Gold pen and case.

MISCELLANEOUS.

Exhibitor.	Article.	Premium.
Master A. D. Bowden.	Best specimen of mechanical ingenuity for knife box	$2
Miss G. Collins	Best map of California	$3
Master H. Brock	Best animal drawing, in pencil	$3
Miss C. White	Best landscape drawing, in pencil	$3
Miss Alice Ashley	Best composition, the special premium offered by the County Superintendent of Public Schools, $10; also the society's premium	

DECLAMATION.

The committee were unable to decide between the merits of Masters Frank Kelsey and W. W. Westbay, and recommended a division between the two of the special premium offered by the teachers of the Stockton High School, $10.

FIFTH DEPARTMENT.

CLASS I—FINE ARTS.

Exhibitor.	Article.	Premium.
Miss C. Petty (seventeen years of age)	Best landscape painting, in oil	$5
Mrs. Dr. Titus	Best exhibition of animal painting, in oil.	$3
Miss Mary Allen	Best specimen of crayon drawing	$3
Miss R. L. Simpson	Best flower painting, in oil	$3
W. W. Westbay	Best specimen of pen drawing	$3
J. P. Spooner	Best exhibit of photographs	$10

SPECIAL.

This embraces a list of all articles exhibited for which no premiums were offered by the society, which the Board of Managers desire, for the gratification of exhibitors, and in justice to them, to notice particularly.

Misses Robins and McKenzie exhibited specimens of buck gloves, manufactured by them, for which a special premium is recommended by the committee who examined them; awarded diploma.

YEAST POWDERS.

The special committee appointed on this article award premium to Dohrman & Co., framed diploma.

They also recommend special mention to Dr. E. S. Holden, Stockton, and to Bowen & Co., of San Francisco, for the same article exhibited by them respectively.

MISCELLANEOUS.

D. A. Learned, of San Joaquin County, exhibited a variety of grapes, not entered for premium, which deserve special mention.

To Joseph Linds, of San Francisco, for fine display of shell work, special mention.

To Capital Sugar Refinery, of Sacramento, for sample of beet sugar, diploma.

To the Pacific Paper Mills, of Stockton, for exhibit of a large assortment of paper produced at their mills, special mention.

To Chalmers Brothers, of Stockton, for the splendid display of carpets, rugs, etc., from their warerooms on El Dorado street, special notice is due.

To Joseph Couturier, of Stockton, for fine display of human hair work, perfumery, and hair dye, special mention.

G. Alagretti exhibited for B. R. Prince, of Calaveras County, a fine collection of silkworms, cocoons, floss, silk, etc., which deserves special mention.

Alexander Mackay exhibited samples of rag carpets which deserve notice.

William Graham, of Stockton, exhibited a case of hardware, comprising a variety of useful articles, which deserves special mention.

N. Gilmore, of El Dorado County, exhibited samples of carriage robes made from the skins of Angora goats, which are very fine, and deserve special notice.

Julius Steiny, of Stockton, exhibited a miniature ship, built by himself, which is a specimen of rare mechanical ingenuity, and demonstrates his skill and taste in ship building.

Lutje & Gross, confectioners, of Stockton, exhibited a bride's cake, which deserves special mention, as being very beautiful, and much admired by the ladies.

R. H. Baird exhibited a case of patent safety lamps, which deserve special notice.

Mrs. J. T. Boyd exhibited two vases with bouquets, and baskets of colored rice, very beautiful.

Mrs. S. E. White, of Sacramento, exhibited a fine collection of shell and moss work, done by herself, which shows great skill and taste, and deserves special notice.

John C. Bell, of San Francisco, placed on exhibition an easy chair, of very superior workmanship, which is entitled to special mention.

W. P. Plummer had on exhibition two photographs from oil paintings, very fine.

Mrs. B. D. Allen exhibited a bedspread fifty years old, in a good state of preservation.

S. M. Woods, of Stockton, exhibited specimens of hand and fluting irons, of new and improved style.

J. R. Meacham, of Stockton, exhibited a model of patent fruit crate.

To Chas. Haas, jeweler, El Dorado street, Stockton, the thanks of the society are due for his magnificent display of diamonds and jewelry of every description; also, a combination clock, which attracted great attention. His exhibit was one of the most attractive features of the Fair.

The model of the "Dexter Windmill," entered by H. C. Shaw, agent, deserves notice.

J. H. Hoyt exhibited a fine collection of birds' eggs.

Mrs. Bertha Bohn exhibited a pair of stockings, knit on one pair of needles, a feat in knitting never before accomplished or heard of.

Mrs. Elizabeth McKee exhibited specimens of needlework, done by herself at the advanced age of seventy years, which is scarcely surpassed by any of the young folks.

Weister & Co., A. Callahan, agent, exhibited a patent washing machine, which for simplicity, durability, and cheapness, is entitled to special mention. The same party also exhibited vise and anvil combined, an excellent article for farmers.

Mrs. C. J. Smith exhibited two cane bottom chairs, reseated by herself in a substantial and workmanlike manner.

Mrs. Speir exhibited a table cover, made by herself when seventy-eight years old.

To Thomas Murray the thanks of the society are due for pyramids of grapes, not entered for premium, but intended to adorn the hall.

J. F. Fugazi, of Sacramento, made a fine display of perfumery, hair dyes, cosmetics, etc., produced at his factory; also, a self-acting fountain. His display was an attractive feature in the hall. Framed diploma.

REMARKS.

The managers return their thanks to Mrs. Eckstrom and E. E. Washburn, Esq., for loan of show cases for display of fancy needlework.

In conclusion they also return their sincere thanks to exhibitors, one and all, for their assistance in making this annual Fair a success. If there has been any omission of the mention of a single article, they ask pardon, and assure the parties neglected that it was not intentional, and are ready and willing to correct, as far as possible, any mistake that may have occurred in the hurry and confusion of the moment Their sole object has been, and is, to do justice to all without partiality. They also return thanks to all those who have served on the different committees, whose decisions, as far as they can learn, have been fair and impartial, and given general satisfaction. To all parties who have so liberally contributed to the society by subscription, enabling the managers to expend over seven thousand dollars for the benefit of the

society, in constructing a new race track, a new grand stand, new fences, stalls, and other permanent improvements, making this Fair the most successful ever held in this district, they beg leave to express their obligations.

COMMITTEE REPORT.

Stockton, October 2d, 1874.

To the officers and members of the San Joaquin Valley Agricultural Society:

Gentlemen: Your Committee on Agricultural Implements (Class No. 1) have made a thorough examination of all the machinery on exhibition in that class, and beg leave to report as follows:

The best display of farming implements is awarded to the Grange Union.

Best thrashing machine to H. C. Shaw (Pitts' Gold Medal Machine). The reasons why your committee give this machine the preference are as follows: First—On account of the thrashing capacity of the cylinder, having fewer bars and more teeth. Second—It saves grain in the shoe better than the Buffalo Pitts. The latter separates grain better than the Gold Medal Pitts, but loses it at the shoe, being one count in favor of the Buffalo Pitts to two in favor of the Gold Medal Pitts.

Best header, to Matteson & Williamson.

Best self-raking reaper, to Grange Union.

Best mower (Champion), to Grange Union.

Best broadcast seed sower (Gem, patented April two, eighteen hundred and sixty-seven, and January two, eighteen hundred and seventy-two), to Grange Union

Best harrow, to D. T. Gillis.

Best straw cutter (Hockings & Co.), to Grange Union.

Best hay press (Eagle), built by Kimball & Co. We would recommend a framed diploma.

Best horse fork, to Matteson & Williamson.

Best grain lifter, to John Hart.

Best grain cleaner (Nash & Cutts), to Grange Union.

Best cultivator, to H. C. Shaw.

At the plowing contest there were several plows entered, all of which did excellent work, but your committee award the premium to the Eureka plow, entered by the Grange Union. We would also make special mention of the Moline plow, which in a lighter soil would give excellent satisfaction.

Best gang of four eight-inch plows, with seed-sower attached, to H. C. Shaw.

Best single steel plow, to Matteson & Williamson.

All of which is respectfully submitted.

J. M. GARWOOD,
C. L. ROBINSON.
J. R. W. HITCHCOCK,
CUTLER SALMON.

PRESIDENT'S ADDRESS.

Gentlemen of the San Joaquin Valley Agricultural Society:

In the closing of this, the fourteenth year of the existence of this society, I deem the occasion not inappropriate to briefly refer to its present condition and future requirements.

At the time, one year ago, you saw fit to confer upon the present officers their honorable positions, the society had, only by the most efficient management, struggled through a succession of poor seasons and other adversities, but at the cost of maintaining its existence its personal property had become comparatively valueless. In assuming their duties the present officers found the stand and other buildings at the race track in a dilapidated condition, and the track itself utterly unfit for anything like a fair trial of speed They discovered, also, that in order to make the society prosperous, to carry out the intentions of their predecessors, and hold a successful Fair, the outlay of a considerable sum of money would be required to make the needed improvements. But, relying upon the assistance of the people at large, as heretofore manifested, the Board of Directors took the responsibility of having the track newly laid out and regraded entire, and to-day the society can boast of a race track that is equal, if not superior, to any in California. A new and capacious stand for spectators has been erected, which will prove adequate for all requirements for years. New stalls were also erected and old ones repaired, and other necessary work done on the grounds, the whole cost of which amounts in the aggregate to nearly eight thousand dollars.

The annual Fair, so far as we have been able to ascertain, proved satisfactory to exhibitors and visitors, and, in a financial point of view, was successful beyond the expectations of the managers. We are enabled, therefore, to retire from office leaving the society in a prosperous condition, free from debt, a surplus in the hands of the Treasurer, and property worth not less than eight thousand dollars.

For what has been accomplished during the year, your officers are not unmindful of the facts that to the liberality of the people of Stockton and of San Joaquin County and Valley they are indebted. Nobly did the people respond to the necessities of the occasion, and to them the praise is due.

To the reports of the Secretary and Treasurer you are respectfully referred for the financial transactions and condition of the society in detail.

Respecting the future of the society, permit me to suggest that there is much to be accomplished yet. At the Fair grounds the greater portion of the old stalls should be removed, and give place to new ones of greater capacity, and with shingled roofs.

A water-tank, of a capacity of not less than five thousand gallons, is needed, by means of which sufficient water could be constantly furnished for sprinkling the track and the streets leading to the grounds, at a much less expense than heretofore.

A tight board fence should be built along the road upon the north side of the grounds.

I would also recommend that the premiums and purses for the coming year be increased at least fifty per cent, believing that such action will awaken a new interest in the society, and produce a corresponding increase in the receipts.

Another matter that I consider of great importance to the society is, that it should become a member of the National Turf Congress without delay. By so doing it will be enabled to enforce a strict code of turf rules that will effectually put a stop to any attempts at fraud in races.

I desire to also submit for your consideration the following amendments to the Constitution:

Amend Section 1 of Article VI, by striking out the words "viva voce," and inserting the word "ballot."

Amend Section 2 of Article VI, by fixing the annual meeting for the election of officers on the first Saturday in December of each year.

My reasons for changing the time for the holding of the annual meeting are, that as the law now stands, it is impossible for the acting Board, during the time of the Fair, to make any exhibit of the transactions of the society, or of the result of the year's work. Besides this, during Fair week there are so many attractions elsewhere that it is difficult to obtain a fair representation of the members of the society; whereas, by making the amendment proposed, the managers will have time to close up the business of the society, and surrender its affairs to their successors with a clear start.

Amend Section 2 of Article XI so that the cost of life membership shall be fifty instead of twenty-five dollars.

As to the increase of the charge for life memberships recommended, I would say that at the time the price was fixed at twenty-five dollars the society had no property of its own, and as the actual unincumbered property of the society has been increased during the last year nearly eight thousand dollars, life membership tickets should be more valuable. In fact, nearly all the persons to whom life memberships were issued last year, have paid fifty dollars and upwards, and I believe the change is necessary for the purpose of increasing the revenue of the society, which is a matter of much importance. At this time nearly every District Society in the State have fixed the charge at fifty dollars.

I would further recommend that the following be added to the Constitution:

"Article 19. The annual Fairs of this Society shall be held in the City of Stockton, San Joaquin County."

It will be apparent to all that this amendment should be adopted, as all the property of the society is situated at this place, and it is the only locality in the district which affords the necessary facilities for holding the annual exhibitions of the society. It is therefore proper that the possibility of removing them from here should be guarded against at once. I would say, in conclusion, that our thanks are due Hon. D. S. Terry for legal services rendered the society, for which he would accept no remuneration; and that to J. A. Hosmer, Esq., for his able and eloquent address upon the occasion of the last annual Fair, the society is under lasting obligations. The members of the society, one and all, have my thanks and those of my associates, for the uniform courtesy shown and the valuable assistance rendered us.

The amendments proposed by the President in his address were adopted *seriatim*.

ANNUAL ADDRESS.

DELIVERED BY J. A. HOSMER, ESQ., OF STOCKTON.

Mr. President, Members of the San Joaquin Valley Agricultural Society, Ladies and Gentlemen:

Another agricultural year is closed. In pursuance of a time honored custom, the farmers of the garden and granary of California—the great San Joaquin Valley—have thronged to their business center to survey the progress of their labors, and ascertain wherein such advancement can be made as to render the next more fruitful than the past year.

I have been honored with an invitation from the Directors of the San Joaquin Valley Agricultural Society to address you on this occasion. The subject is new to me, but if in the remarks I have to offer, I shall be fortunate enough to say anything that will encourage our agriculturists in their labors, I shall have accomplished all that I expect.

Little thought the Hon. Mahlon Dickerson, when opposing legislation for Oregon and the navigation of the Columbia in the United States Senate in eighteen hundred and twenty-five, because of their remoteness, that the Pacific Coast would be the commercial mart it is to-day. Little dreamed the men of Mexico, who signed the treaty of Guadalupe Hidalgo, of the richness and productiveness of the soil they were consigning to the United States. And the swarms of gold hunters, who came here to make and depart with speedily acquired fortunes, would have deemed you madmen had you told them that before the first quarter of a century had passed, the grain districts of the old and new world would have been surpassed in their annual production by that of your great valley.

ANTIQUITY OF AGRICULTURE.

Agriculture in some form has existed ever since the expulsion from Eden. The yearly journeys to Egypt from the interior countries of Asia, to purchase corn and other products, are familiar history to all juvenile students. Greece and Rome boasted of a cultivated agriculture during their golden day, and produced theorists who devoted their exclusive attention to the development of it as a science. The people of the Middle Ages, though discarding the useful arts, and sacrificing learning at the shrine of conquest and bloodshed, forgot not to till the soil, and win for themselves a subsistence.

IMPROVEMENTS IN AGRICULTURE.

Improvement in agriculture has kept pace with the general progress of mankind. The past century, through the labors of Lord Kames, Sir

Humphrey Davy, Humboldt, Sir John Sinclair, Baron Liebig, and others of our own country, has made it the subject of scientific experiment and investigation, until it is entitled to rank among the most interesting as well as most useful of human pursuits. Machinery for its successful prosecution has been improved, so that those who twenty years ago would handle the scythe, sickle, flail, and old fashioned plow submissively, now feel indignant at the bare mention of such implements of labor in presence of the reaper, the mower, the header, the thrashing machine, and the gang plow.

OUR ADAPTABILITIES.

Of all the soil upon which agriculture may be prosecuted as a science, none appears better adapted to realize its highest attainable perfection than this valley. The experience of fifteen years shows that a good crop can be calculated upon seven of every ten years; the other three never entirely fail.

California needs no better encouragement to her immigration than the yearly reviews of her exports and imports. Those who dreaded the new El Dorado for its exposures and privations when the discovery of gold was made, may naturally wonder at its first quarter century's development. Had the early rangers, who used the foothills and bottoms of the San Joaquin Valley as pasture for their stock, ever dreamed of it, we should, to-day, have found this immense domain in the hands of a different people. But it was otherwise ordained, and when the dreams of independence vanished, as the placer failed which inspired them, men necessarily turned their attention to the cultivation of the soil. Ceres, with her sheaves of golden wheat; Pomona, with her rich harvests of fruit; and Pan, with his numerous flocks, were the deities which succeeded to the ardent, but often, alas! illusive worship of Midas.

Agriculture has made California what she is to-day. Her greatest wealth is in her two immense valleys—the one commencing among the snows of Shasta, whence it stretches to the Bay of San Francisco, the other springing amid perfumed orange and lemon groves, and advancing for hundreds of miles to meet its sister, where the waters of Suisun widen to receive it.

SAN JOAQUIN VALLEY.

Of this latter valley I am to speak. From the land fed by its beautiful river comes this grand display of life supporting stores. Before such an exhibition famine and disaster shrink back appalled. We forget them in the survey, grateful that no desolation like that of Bengal and Cæsarea; no winged pest like that which has just swept away the crops of our interior territories, have scourged our favored soil.

What is the sight that greets the eye when traversing this valley? Wheat—the cereal that stands in the van of all others—stretching for miles along the plains and slopes. This silent expositor of thrift, of plenty, of success, in unmistakable language says: the means of life for ourselves and starving millions in less favored regions are here. You who hold the rod of empire, who in the cities engage in trade, in mechanical and professional life, derive your daily bread from this soil. Here the grandest of all industries is pursued with abundant success.

I read recently the statement of a disappointed adventurer, who either never saw your fruitful valley, or was so lost to shame and truth as to proclaim the idea a fraud that California was an agricultural State. No other State in the Union proffers equal advantages for the pursuit of a diversified and remunerative agriculture. The rains that moisten the soil make no uncertain appearance. The gang plow performs its office when the prairies of the East are receiving their nutrition from the Winter's snow. The seed is sown when Eastern farmers seek a cheerful fire, and would sooner dream of a journey to the pole, than of attempting to prepare and plant the frost-hardened earth for a successful harvest. The pure water causes the seed to germinate at the early approach of Spring, and the full crops to ripen in the rays of a never-failing sun, whose going down is followed by cooling, but not frosty nights. Under these genial influences spring forth the wheat, the barley, the oats, that portion of which is sown for hay being cut before the grain matures in April or May. The fields thus vacated are planted with corn and other crops, which, when gathered, the soil is again ready for the plowshare. That which is left to ripen is harvested in the Summer. It is the surplus of this great annual crop that creates our commerce, and contributes to the support of the needy millions of Europe.

THE CROP OF EIGHTEEN HUNDRED AND SEVENTY-FOUR.

The year just closed has been more than ordinarily fruitful. Our crop for export is nearly a third larger than in any former year of our history. Our farmers have great cause for thankfulness in an assurance so amply corroborated by the long trains, crowded warehouses, and freighted steamers, barges, and schooners. The superiority of our wheat is not alone determined by the size and fullness of the berry. Those of you who were among the pioneers, remember the unfailing tendency of Eastern wheat to ferment in its transit through the tropics, and must be rejoiced to know that this process never affects our California wheat. It retains the same sweetness at Liverpool, after twice crossing the equator, that it possessed on leaving the field. The surplus crop this year will require for transportation one thousand ships of the largest class.

GARDEN CULTURE.

But while your attention has been given to the cultivation of wheat, I regret to observe your neglect of the garden. A garden attached to each farm, instead of being a detriment, would prove an economy. It is not encouraging to be told by a city vegetable vender that his business within eighteen miles of Stockton, in the oldest agricultural county in the valley, is as good as in the town. This shows that grain has usurped all. You cultivate flowers to adorn your farmhouses. Why not cultivate vegetables to supply your table? You may think that you will have more than you can utilize; but if the market is not near at hand, how easy to have a barnyard! There would be customers always ready to receive your surplus and dispose of it profitably. The horned stock would greet you with a low of satisfaction at the appearance of turnips, carrots, and other roots. The melancholy hog, which is willing to compel you to pass on both sides of him, and not apprise you of his intentions, scorns not to interview potatoes and cabbages, and the gentlemanly chanticleer, with his numerous harem, will crow his thanks for every

kernel that falls to his share. Assuredly, then, the garden should be a part of the farm.

LAND MONOPOLY.

There are now about two millions of acres under cultivation, ten millions susceptible of cultivation and pastoral purposes, besides one million of swamp land that may be reclaimed. Large as our display is on this occasion, its failure to be larger is attributable to the fact that a great portion of this immense domain is in the clutch of speculators. None of the evils which threaten to embarrass the future growth and prosperity of our State are more pregnant with disastrous consequences, alike to personal independence and equal government, than this consolidation, because it prevents the growth of that strong and permanent interest in government and law and free institutions, which is inseparable from a widely diffused property in the soil. Look to your legislation, and see that these lands are fully taxed, and this monopoly will gradually disappear. Are not the reasons sufficient? You have one vast garden. Eden could have boasted no greater variety than do you. The foothills loom up round and beautiful, with a plea to relieve them of their sterility. Kern and Fresno, as well as the northern counties, tell of wool, estimating the product of that staple in the millions. Sheep raising may be almost indefinitely increased with profit, and in time render manufactories an absolute necessity. Few local industries are more profitable, and none can more greatly contribute to the general prosperity. The rivers of the valley are capable of affording ample water-power, and every natural facility is at hand for making woolens a leading article of commerce.

THOROUGH CULTURE.

Permit me also to call your attention to the necessity of thorough cultivation. Study your soil and know its fructifying properties. If your crop is a failure the first year, yield not to despair, but ascertain the cause and remedy it the next time. California has proven herself rich in agriculture. Spreading a false report because your harvest has not been as thrifty as your neighbor's, is not advantageous to you. Perseverance will accomplish the work. If the super-soils fail for want of depth, utilize the sub-soil. Consult with your neighbors who have learned by practical study. Forego for an experiment any conceit you may have of your own skill, and I imagine that the rural papers of the East will less frequently publish defamatory letters on California agriculture.

IRRIGATION.

Experience has shown that land, like living things, requires sustenance. Its food is water. However impure the quality, the soil in grateful satisfaction laps it up, producing the ferment requisite for germination, and acknowledges the gift by a fruitful crop. When the lands of Egypt became too dry by the failure of the waters of the Nile to perform their accustomed office, the inventive genius of man discovered means to cover their surface with the invigorating fluid. Scotland, England, and continental Europe, too, have taught the lesson of economy by irrigation. Your valley is no exception to this rule. Rich as its soil may be, it cannot yield without nourishment; and when the rains have ceased the farmer knows what he may hope to reap. A system to flood

the lands, controlled by the farmers, by making canals from the rivers of the upper valley, would be of inestimable value to those who suffer from drought. Make it a benefit, not a ruler; a protector from failure, not a devourer of your profits. With flood-gates that could be opened and closed at will, and no fear of the Sheriff's presence at harvest, a new link would be added to the chain of agricultural success. The fruit trees of the Sierra foothills would bend their boughs with the apple, the pear, the peach, the plum, the pomegranate, the lemon, the lime, the fig, the banana, and the mulberry. The rich alfalfa would there find a fruitful bed. The uncertain wheat fields would rejoice in luxuries that they never knew before. The numerous herds would eke out a comfortable existence above the bottom lands in green fields which are now the home of the scrub oak and the manzanita. A volume might be profitably written upon this subject. Our agricultural domain can never be half developed without a system of irrigation, as all may see who will read the carefully matured views advanced by Hon. M. M. Estee, in his address at the State Fair last week. Let me commend that valuable document to the careful perusal of all our farmers. No portion of the population of the State are more deeply interested in the subject.

RECLAMATION.

But while you pray for water, consider that there is such a thing as too much water. This presents a singular phenomenon. While your valley contains the richest and most productive soil in the world, it is bordered by a tule swamp utterly unfit for occupation. Geologists say that which is life to plants is death to man. Most injurious substances to one are invaluable to the other for their regenerating, fertilizing qualities. We learn from the fens of England and Scotland, that the three millions acres of tule land in this State were created for nobler purposes than the production of snakes, lizards, and pestilential diseases. The truth of this is shown in the reclamation of Grand and Sherman Islands. This year the estimate of wheat from these once submerged tracts, is four hundred and fifty thousand bushels, or an average of about forty bushels to the acre. Barley, two thousand acres of which have been raised, is said to range from fifty-five to seventy-four bushels to the acre. Flax and beans yield liberally to a careful culture. Our hopes of being able to manufacture our own sacks are encouraged by the limited but promising culture of jute and ramie. The corn, squashes, melons, cucumbers, and kitchen garden vegetables generally, grow in rich abundance. The profuseness and variety of the grape, gives assurance of a wine region unequaled in quality and quantity by that of any other nation, and which will eventually exercise a controlling influence in the markets of the world. The moisture below the dry surface will produce two crops in a season. The dairy will thrive, the wool growers will profit by the experiment, and the horned stock will fatten upon that which six years ago was fruitful cause of disease and death. Can you then, with such an illustration, permit these vast acres of unreclaimed soil to lie idle, when, by a slight comparative expenditure, they may be brought into equal fertility with the lands already under cultivation? You cannot throw away this advantage for lack of energy. Reclaim the land by drainage, and give the useful cereal the place of the useless tule. And let me, in this connection, urge the people of San Joaquin to set the example, and excavate a canal to deep water that

will not only drain the land, but open for the entrance of large ships the natural commercial entrepot of this valley.

FERTILIZATION.

The agricultural chemist tells us that the productive quality of the soil when under cultivation, is constantly diminishing. Land once yielding plentifully, is by the continued cultivation of one exhausting crop, gradually destroyed in its capacity for production, and its fruitfulness can be recovered only by rotation or fertilizers. The wheat crops of this valley are now all that could be wished for. Year after year the same land yields one crop of this king of products, and oftentimes a volunteer crop. These, without change, must sooner or later destroy fertility. Would it not be well to have an eye to the future as well as the present, and relieve the labor of the soil by an occasional crop of some other cereal than wheat, or better still, some root crop or a green manure or Summer fallow. And where the show of fertility is apparent, let us supply the needful property, and leave the reviving process to act upon exhausted nature. But whatever the culture, see that it lacks not water. Sahara, now a plain of sterile sand, with water would produce a thriving crop.

DIVERSITY OF CROPS.

Diversity in crops is also needed. Wheat, with a constantly increasing demand in China and Japan, as well as Europe, should not be cultivated to the exclusion of other products. Invite immigration. If immigrants are poor but laborious, under the farm rental system they can supply the demand for wheat raised on virgin soil, instead of that which you would overburden. Your soil is your life. See the miraculous tales it bears to the markets of the world. Barley, rye, oats, and corn will never beg for purchasers. The garden products are never drugs. Your wheat and other cereals could be more economically freighted if you supplied from your own fields the jute and ramie to sack them. The culture of the sugar beet, which has been so successfully utilized in Sacramento County, can be profitably increased. In the counties south of the Stanislaus, great success has been attained in the culture of cotton. About three thousand acres, planted within our borders, the greater part in this valley, with satisfactory results, show that a little attention will give it an important place among our valuable exports. From the mulberry, upon which the silkworm thrives, its cocoons are spun, but more of them are necessary. In the fragrant orange and lemon groves the busy bee finds the nectar with which his cells are stored. The fruit trees are laden with their various products. These are sought for at remunerative prices in less favored regions; and the demand for them at home for drying and preserving, without an increase of production, must soon exceed the supply. From the fading forest comes an appeal for company. Houses must be built, and lumber is required to build them. The vacant soil will graciously afford nutrition to the forest trees—the pine, the fir, the cedar, and the redwood—for building; the Australian gum or Eucalyptus for manufacture, and the cork elm for city and valley ornamentation.

CULTIVATE SMALLER FARMS.

In many portions of the valley crops are not as fruitful as they might be. What is the trouble? Farmers, do you not undertake more than you can successfully perform? Do you not attempt to cultivate immense tracts, and for want of proper attention your crop fails? Land requires different usage in different locations. The Summer fallow system and utilizing of the subsoil, practically illustrate their remedial properties. Could you not profit by the advice of Virgil? "A farmer may praise large estates, but let him cultivate a small one." Seek for tenants among those who come to our shores for a home, many of whom, I am sorry to say, have left disheartened during the past season, for want of encouragement. A small farm, well tilled, is better than a large one unfruitful.

PRESENT CAPABILITIES.

It is estimated by the London *Times* that the English wheat crop is deficient ninety million bushels. This statement has been disputed. But if it be true, the deficiency must be supplied in part by the United States. Our valley must be a prominent contributor. The foreign hop crop is also reported a failure. This must be measurably supplied by California. The grape, hanging in rich clusters and in endless variety, should never fail for want of careful culture. Farmers, include the arbor with the garden. It has been estimated that the product of our vines will average six hundred gallons of wine to the acre, which is fifty per cent greater than that of France, and three times that of Germany. The fruit crop is larger than ever before. The report from the dairy is good, but it is believed that with the factory system, founded on scientific principles like that of New York, the yield would be increased nearly or quite twenty per cent. Where the garden is cultivated the yield is all that can be desired, and Eastern products are pigmies in comparison with ours.

Amador County comes with a story that the wild coffee berry is flourishing there, and we are hopeful soon to afford our aged maidens, of both sexes, their comfortable cup of tea free from import duties.

When evening closes

"The lowing herds wind slowly o'er the lea."

The sheep eke out a comfortable life upon your valleys, plains, and hills, bountifully fleeced with wool. The Angora and other goats pay well for their sustenance. The grunters, always on the lookout for some friendly cesspool in which to indulge their independent tastes (for Charles Lamb says they are the only gentlemen), are not strangers, and the shrill clarion of the cock announces that the henery is not neglected. And still another, the truest friend of man, the sagacious horse, seemingly graded in his social life, as is the human race. First he comes with glossy coat, expanding nostrils, arched neck, his value commanding thousands as his fleetness is increased by seconds, while behind him appears his more humble brother, less lordly, but more contemplative, of value measured by a hundred or less, but which, for all utilitarian purposes, no farmer would exchange for Occident, Purdy or "Old Thad." himself. We have also a good supply of the long-eared animals—four

legged ones, I mean—and the visions of the tedious journeys of the plains rise into view at the very flap of their prodigious ears.

AGRICULTURAL EDUCATION.

Farmers, you are men advancing in years; you have sons growing up around you, and it will be but a short time before they will be called upon to fill the places you now fill. We live in a progressive age. When advancement can be, and is not made, the retrogression is a sorry one indeed. Agriculture is a science which embraces in its elimination nearly all the physical sciences. We must understand chemistry, geology, physics, mechanics, botany, zoölogy, and economics, to fully appreciate it. Congress has caused to be organized a Department of Agriculture, which, by yearly reports, gives farmers in all localities the different processes of culture throughout the Union. So great have been the improvements in agriculture, that it has been introduced as a science into the universities. Professorships of its different branches have been instituted, and National endowments made for Agricultural Colleges in all the States, to educate scholars and teachers, as well in the practice as the theory of this great pursuit. Our State has acceded to the terms of these National endowments, and they have been given to her university. The law contemplates that not only shall the theory of agriculture be taught, but the practice also, by the preparation of land, the application of fertilizers, irrigation, and the dextrous use of farming implements. The University of California has neglected to introduce these auxiliaries in her system of instruction, but in the stead has adopted a theoretical curriculum. Cornell and other colleges of the East, acting upon the experience of foreign universities, have adopted a system of practical teaching that has met with general approval and commendation. The Grangers, last Winter, in a memorial to the Legislature, petitioned for the introduction of a like system in our university, but the Board of Regents avoided a compliance with their request; and the Legislature did not give the subject the attention they asked for it. Theory is indispensable, but unaccompanied by practice, it begets an arrogance in the student that hard experience can alone correct. The agricultural neophyte, without illustrative culture, will find, after graduation, that there are knacks which no theory can explain, and that the persuasive eloquence of a hickory stick is better in conquering the spirit of a kicking heifer or a fractious colt than any amount of applied science. You ask a chemist where the greater part of his knowledge was received, and he will tell you: in the practical illustrations of the laboratory. You ask the merchant. He will say behind the counter. You ask the printer, and his reply is: in the persistent lessons taught at the case. You ask the professional man. His answer will be: his research applied to practice. You ask the farmer, and he will say the field. Theory without practice never raised a blade of grass, but practice without theory has fed the world for centuries. Theory is good, but practice is the crown. One is necessary; the other indispensable; but full proficiency, in a science so comprehensive as agriculture, requires the employment of both.

MORALS OF AGRICULTURE.

No one class have more to gain from a strictly moral life, or more to lose from an immoral one, than farmers. Their occupation, to be suc-

cessful, requires the constant exercise of their best mental and physical powers. Without this, and especially if the absence of it is occasioned by any bad habits, such as negligence, indifference, or, worse than all, intemperance, no matter how numerous the acres, or how rich the land, their owners are sure of embarrassment and failure. In California, where the crop is always as good as gold, the farmer's road to independence, even to affluence, is as plain as if it were marked by a sunbeam. He can early acquire the means to build and beautify a home, and adorn it with all the elegancies as well as mere necessaries of life—and who so independent, so much at ease, so free from worldly care as he, when he can look forth from under his own vine and fig tree upon his groaning acres, his flocks and his herds, and say, in the joy of a grateful heart: "These are all mine; I am free from debt; I have no expensive or injurious habits; my family is happy, and I am contented." Can money or industry be put to a better purpose in this world than to purchase these simple blessings?

RAILROADS.

The invitation I received was to address you on agriculture, not on politics. I shall therefore accord that almost inevitable subject, the railroad, but a single remark. The war on railroads is made upon the ground that these powerful agents in civilization should be servants, and not masters, of the people. While they are absolutely necessary to the welfare, and greatly aid in the development of the country, they are entitled to just remuneration for their services; but when they assume to dictate the policy of the country, like any other servant, the people are justified in teaching them their place.

THE GRANGE.

Farmers, last year you formed an order which you termed the Grange. Its declared objects were protection and consultation. It received, at the time, the commendation of all persons friendly to our agricultural interests. I regret to state that this tone of commendation has been changed to one of complaint. No two classes of society should harmonize in their interests and feelings more fully and cordially than the farmers and merchants. They are mutually dependent, and the growth and prosperity of both the country and town depend upon their coöperation and labors. If the Grange fails to sustain this relationship, its abandonment, as you will surely experience, is preferable to its existence.

CORN CITY OF THE PACIFIC.

The "City of Windmills" I must commend as the corn city of the Pacific. Proud may she be of her title, boastful in the consciousness that immigration will meet a hearty welcome, and find a healthful rest in her confines. Her mammoth warehouses, filled with golden grain; her woolen mills, her flouring and paper mills, are but vanguards in a prosperity soon to be more numerously illustrated. Her streets will soon be traversed by another iron track. The coal of Amador must soon encourage the erection of new manufactories, and open new avenues to enterprise and labor. And when the ship canal shall be com-

pleted, and wharfage afforded the stately crafts of the deep, like Julia, in the Hunchback:

"She'll shine, be sure she will."

OUR FAIR GROUNDS.

It is as creditable to the Directors as it must prove to you, to witness the improvements made in the race course by an elevation of the track, and the construction of a new stand of double the capacity of the old one, and the addition of fifty new stalls, and the needful supply of sheep-pens to our Fair grounds. No pains have been spared to meet every demand and supply every convenience, and yet, as an evidence of the increasing interest felt by the farmers in our annual Fair, all these conveniences have been engaged. As a further evidence of the liberality of the citizens, it affords me pleasure to state that these various improvements were made at an expense of eight thousand dollars, cheerfully subscribed by them for the purpose. These improvements increase the capacity of the Fair grounds to more than double their extent when the first Fair was held in this valley, and even now there is not a foot of room to spare.

CONCLUSION.

The achievements that your orator twelve years ago (Rev. Thomas Starr King) prophesied for your valley at the expiration of one hundred years, will be fully realized in less than half that period.

In conclusion, I cannot urge you too earnestly to diversify your agriculture. Let wheat, rye, barley, oats, and corn all claim your care, but remember your isolated condition, your separation from the markets of the East, from the isles of the Pacific, and the Oriental nations, by thousands of miles of land and water. Let your cotton, the superiority of which is acknowledged in the marts of Memphis, share your favor with the cereals. Give the dryer your fruit and the vintner your grapes. Cultivate jute and ramie for your sacks, the sugar beet for your sugar. Forget not the forest tree. Accord to hemp and flax an ample trial. Remember that alfalfa is thrifty, that the product of the garden is always in demand; that the olive, the almond, and the walnut are fully domesticated, and that all semi-tropical productions flourish as if our soil had always been their abode; that the mulberry gives the silkworm an existence, and that nearly all these varied offsprings of the soil are so many encouragements to the erection and profitable working of manufactories. Assuredly, with a valley possessing such wonderful advantages, with the whole world for a market, we inherit a wealth greater than that of any other equal portion of the wide world's surface. To use the language of Moses, ours is "a land of wheat, of barley, of wines, and fig trees, and pomegranates; a land of oil, olive, and honey; a land wherein thou shalt eat bread without scarceness; thou shalt not lack anything in it; a land whose stones are silver, and out of whose hills thou mayest dig 'gold.'"

TRANSACTIONS

OF THE

Sonoma and Marin District Agricultural Society,

FOR

THE YEAR 1874.

REPORT.

PETALUMA, SONOMA COUNTY, CALIFORNIA,
December 5th, 1874.

To the honorable the State Board of Agriculture:

GENTLEMEN: The Board of Managers of the Sonoma and Marin District Agricultural Society herewith submit their annual report for the year eighteen hundred and seventy-four:

To amount cash received, 1874	$5,294 02	
Disbursements.		
By amount paid premiums		$1,522 00
By amount paid purses		1,700 00
By amount paid current expenses		2,060 49
By balance cash on hand		4 53
		$5,294 02

J. R. ROSE, President.

E. S. LIPPITT, Secretary.

PREMIUMS AWARDED.

HORSES.

Exhibitor.	Animal.	Premium.
	Thoroughbred.	
James Watson	Best stallion, four years old or over	Diploma and $25
J. G. Underhill	Best stallion, three years old and under four.	$20
Seneca Daniels	Best stallion, one year old and under two	$10
James Watson	Best mare, four years old or over	$20
J. G. Underhill	Best mare, three year old and under four	$15
J McM. Shafter	Best mare, two years old and under three	$10
James Watson	Best suckling colt	$5
	Graded horses.	
James Watson	Best stallion, four years old or over.	$15
G. R. Perkins	Best stallion, two years old and under three.	$8
A. P. Whitney	Best stallion, one year old and under two	$5
J. L. Taylor	Best mare, four years old or over	$12
P. Carroll	Best mare, three years old and under four	$9
H. Mecham	Best mare, two years old and under three	$7
James Watson	Best suckling colt	$5
	Horses of all work.	
T. B. Carey	Best stallion, four years old or over.	$12
T. J. Fuller	Best stallion, three years old and under four.	$10
E. Dowd	Best stallion, two years old and under three.	$8
James Fields	Best stallion, one year old and under two	$5
J. Ferguson	Best mare, four years old or over	$10
	Draft horses.	
Charles McDevitt	Best stallion, four years old or over.	$20
Charles McDevitt	Best stallion, three years old and under four.	$15
J. Ferguson	Best mare, four years old or over	$12
G. D. Green	Best mare, three years old and under four	$9
G. D. Green	Best mare, two years old and under three	$7
J. Ferguson	Best suckling colt	$4
	Roadsters.	
Robert Crane	Best stallion, four years old or over.	Diploma and $15
Dan. Brown	Best stallion, three years old and under four.	$15
A. McCune	Best stallion, two years old and under three.	$10
J. A. McNear	Best mare, four years old or over	$12
Wm. Emory	Best mare, three years old and under four	$9
Seneca Daniels	Best mare, two years old and under three	$7
	Carriage and saddle horses.	
L. W. Walker	Best matched span roadsters, owned and used as such by one person	$20
J. A. McNear	Best single buggy horse	$10
Frank Mecham	Best saddle horse	$5

CATTLE.

Exhibitor.	Article.	Premium.
	Thoroughbred.	
S. B. Emerson	Best Durham bull, four years old or over	...Diploma and $20
Colonel Younger	Best Durham bull, three years old and under four	$15
Carr & Chapman	Best Durham bull, two years old and under three	$10
Carr & Chapman	Best Durham bull, one year old and under two	$8
Carr & Chapman	Best Durham bull calf	$5
Carr & Chapman	Best Durham cow, four years old or over	$15
Colonel Younger	Best Durham cow, three years old and under four	$10
Carr & Chapman	Best Durham heifer, two years old	$8
Colonel Younger	Best Durham heifer, one year old	$5
Carr & Chapman	Best Durham heifer calf	$4
S. B. Emerson	Best Holstein bull	...Diploma and $20
W. D. Bliss	Best Alderney bull, two years old and under three	$10
J. McM. Shafter	Best Alderney bull, one year old and under two	$8
J. McM. Shafter	Best Alderney heifer, two years old and under three	$8
S. Daniels	Best Devon bull, three years old and under four	$15
S. Daniels	Best Devon cow, four years old	$15
S. Daniels	Best Devon bull calf	$5
S. Daniels	Best Devon heifer, one year old and under two	$8
	Graded stock.	
T. M. Chapman	Best bull, four years old or over	$15
R. Harris	Best bull, three years old and under four	$10
P. Mallaly	Best bull, two years old and under three	$6
I. R. Jewell	Best bull, one year old and under two	$4
P. Mallaly	Best cow, four years old or over	$10
C. Clark	Best heifer, three years old or over	$8
S. B. Emerson	Best heifer, one year old and under two	$3
A. G. Medley	Best bull calf	...Special mention.
	Sweepstakes.	
Carr & Chapman	Best herd, of not less than six animals and not more than one male	Diploma and silver pitcher, valued at $25.

GOATS.

Exhibitor.	Article.	Premium.
S. A. Rendall	Best Angora goat	...Diploma and $10
S. A. Rendall	Best three Angora does	$10
S. A. Rendall	Best four Angora kids	$5

SHEEP.

Exhibitor.	Article.	Premium.
	Thoroughbred.	
H. Mecham	Best Spanish ram	$10
John Judson	Best three Spanish ewes	$10
R. Crane	Best three Southdown ewes	$10
R. H. Crane	Best Southdown ram	$10
John Judson	Best Cotswold ram	$10
S. B. Emerson	Best three Cotswold ewes	$10
S. B. Emerson	Best six ewes	$5
S. B. Emerson	Best six Spring lambs	$5
	Graded stock.	
J. P. Rodehaver	Best ram	$8
R. Crane	Best six ewe lambs	$5

SWINE.

Exhibitor.	Article.	Premium.
J. McM. Shafter	Best Berkshire boar	$8
William Hill	Best Berkshire sow	$5
Robert Crane	Best Essex sow	$5
R. H. Crane	Best China Poland sow	$5
	Graded stock.	
Robert Crane	Best boar	$6
William Cromwell	Best sow	$4
Robert Crane	Finest and fattest hog	$5

PURE BRED POULTRY.

Exhibitor.	Article.	Premium.
T. D. Morris	Best exhibit of not less than five varieties	$10
T. B. Cary	Best lot Light Brahmas	$2 50
T. R. Jacobs	Best Dark Brahma cock under one year	$2
T. R. Jacobs	Best Light Brahma cock under one year	$2
Frank Ennis	Best lot Buff Cochins	$2 50
D. M. Winans	Best lot Black Cochins	$2 50
T. D. Morris	Best lot Partridge Cochins	$2 50
Thomas Shery	Best lot White Dorkings	$2 50
J. Judson	Best lot Silver-spangled Hamburgs	$2 50

POULTRY—Continued.

Exhibitor.	Article.	Premium.
T. D. Morris	Best lot Gold-spangled Hamburgs	$2 50
J. B. Gossage	Best lot Black Spanish	$2 50
P. Sullivan	Best lot Brown Leghorns	$2 50
J. W. Harris	Best lot White Leghorns	$2 50
J. Louglane	Best lot Gold-spangled Polish	$2 50
P. Sullivan	Best lot White-crested White Polish	$2 50
John Judson	Best lot Houdans	$2 50
T. B. Cary	Best lot Game	$2 50
T. D. Morris	Best lot Sultans	$2 50
J. P. Rodehaver	Best lot Bronze turkeys	$5
J. P. Rodehaver	Best Bronze turkey gobbler	$2 50
Robert Crane	Best lot Embden geese	$2
T. D. Morris	Best lot Gray China geese	$2
Robert Crane	Best lot Rouen ducks	$2

AGRICULTURAL PRODUCTS.

Exhibitor.	Article.	Premium.
J. Purrington	Best exhibit of grain, not less than four varieties of one hundred pounds	$10
G. D. Green	Best sack of Australian wheat, not less than one hundred pounds	$5
Gus. Peterson	Best sack of Club wheat, not less than one hundred pounds	$5
J. Purrington	Best sack of Chili wheat, not less than one hundred pounds	$5
C. F. Munday	Best sack of Smith wheat, not less than one hundred pounds	$5
Robert Crane	Best sack of barley, not less than one hundred pounds	$5
John Kendall	Best sack of rye, not less than one hundred pounds	$5
J. B. Gossage	Best sack of Surprise oats, not less than one hundred pounds	$5
M. Gillam	Best sack of oats, any other variety, not less than one hundred pounds	$5
A. McCune	Best sack of wheat flour	$5
A. McCune	Best sack of cornmeal	$3
Robert Crane	Best sack of shelled corn, not less than one hundred pounds	$5
C. Tempel	Best exhibit of leaf tobacco	$3
Thomas F. Ryan	Best collection of potatoes	$3
John Kendall	Best exhibit of onions	$2
William Cromwell	Best exhibit of squashes	$2
S. D. Towne	Best exhibit of pumpkins	$2
Dr. Farrar	Best exhibit of peas	$2
William Gibson	Best exhibit of sugar beets	$2
Dr. Farrar	Best exhibit of mangel wurtzels	$2
R. H. Crane	Best six blood beets	$2
George Campbell	Best exhibit of corn on stalk	$2 50
Robert Looney	Best exhibit of broom corn	$2
H. Mecham	Best exhibit of cabbage (not less than five heads)	$2
W. H. Pepper	Best exhibit of watermelons	$2
Robert Crane	Best exhibit of muskmelons	$2
T. D. Morris	Best exhibit of cantaloupe melons	$2
W. H. Pepper	Best exhibit of pie plant	$1

FRUITS, GRAPES, NUTS, ETC.

Exhibitor.	Article.	Premium.
W. H. Pepper	Largest and best collection of fruit raised in one orchard	$20
M. Gillam	Second best collection of fruit raised in one orchard	$10
J. Harmon	Best exhibit of apples	$5
E. S. Lippitt	Best single variety—six apples	$2 50
Dr. Farrar	Best six varieties of apples—three each	$3
J. Purrington	Best collection of pears	$5
E. S. Lippitt	Best single variety—six pears	$2 50
J. Purrington	Best six varieties of pears—three each	$3
M. Gillam	Best six quinces	$2 50
Mrs. Fowler	Best collection of oranges	$5
Mrs. Fowler	Best collection of lemons	$3
Morris Brothers	Best collection of grapes—not less than six varieties	$15
Morris Brothers	Best exhibit of foreign grapes	$5
Mrs. Fowler	Best exhibit of California grapes	$2
Morris Brothers	Largest bunch of grapes of any variety	$3
Morris Brothers	Best collection of figs—ten pounds	$2
J. L. Mock	Best collection of plums	Special mention.
Mrs. Fowler	Best collection of olives	Special mention.

The Committee on Fruit make the following additional report:

The committee find the exhibition of fruit very creditable, and experience much difficulty in deciding between competitors. They would make particular mention of the exhibits by Geo. D. Green, of dried and canned fruits; of T. Shery, of apples, pears, and dried fruit; of Mrs. Rowland, of apples, grapes, and some dried apples and plums; Mrs. Berger, canned fruit; D. G. Heald, Porter Ward, and George Campbell, each a very creditable exhibition of fruits. The committee regret that premiums cannot be given to all. [All the members of the committee, except Mr. Chapman, subscribed to the following:] A portion of the committee, in closing their labors, feel it a duty to notice the exhibition of fruits made by W. W. Chapman, from his orchard, as among the best, and entitled to a premium; but the same were placed on exhibition, and not entered for competition.

BUTTER AND CHEESE.

Exhibitor.	Article.	Premium.
George Campbell	Best box of fresh butter	$10
G. Watson	Best packed butter	$5
J. E. Jewell	Best exhibit of cheese—not less than three	$5

WINE, CIDER, ALE, ETC.

Exhibitor.	Article.	Premium.
Mrs. Gibbs	Best exhibit of currant wine	$5
Michele & Griess	Best exhibit of beer	$2 50

PRESERVED FRUITS, ETC.

Exhibitor.	Article.	Premium.
J. Purrington	Best exhibit of dried fruits—not less than five varieties — three pounds each, kiln dried	$5
Mrs. Warren	Best exhibit of dried fruits—not less than five varieties — three pounds each, sun dried	$5
W. H. Pepper	Best exhibit of dried apples—not less than five pounds	$3
J. Purrington	Best exhibit of dried peaches—not less than five pounds	$3
W. H. Pepper	Best exhibit of German prunes—not less than five pounds	$3
J. L. Mock	Best exhibit of dried plums—not less than five pounds	$3
J. Purrington	Best exhibit of raisins—not less than five pounds	$5
Mrs. N. M. Hedges	Best exhibit of canned fruits—five varieties	$5
Mrs. Haven	Largest variety of canned fruits	Special mention.
Mrs. S. D. Towne	Best exhibit of jellies—five varieties	$5
Mrs. N. M. Hedges	Best exhibit of preserves—three varieties	$5
Mrs. G. B. Pepper	Best exhibit of pickles—five varieties	$2 50
Mrs. Rowland	Best exhibit of catchup—three bottles	$2 50
Robert Crane	Best exhibit of side bacon	$3
Robert Crane	Best exhibit of hams—three or more	$3

MISCELLANEOUS.

Exhibitor.	Article.	Premium.
A. Hahn	Best exhibit of upholstery	$5
Wm. Zartman & Co	Best exhibit of blacksmithing	$5
M. O'Brien	Best exhibit of horse shoes	$3
P. Sullivan & Co	Best exhibit of boots	$5
J. Wick	Best exhibit of leather	$5
R. Looney	Best exhibit of brooms	$3
P. Cowen	Best washing machine—Humboldt	$3
P. Cowen	Doty machine	Hon. mention.
Fisher & Ragan	Best exhibit of marble work	Diploma.
B. Sartori	Best butter box	$3
Eddie Lippitt	Best cane work	$2
T. R. Jacobs	Best set of plans for farmhouse and stable	$5

CARRIAGES, BUGGIES, AND WAGONS.

Exhibitor.	Article.	Premium.
Wm. Zartman & Co	Best exhibit carriages, buggies, wagons, etc.	$25
Wm. Zartman & Co	Best family carriage	$12
Wm. Zartman & Co	Best buggy	$10
Wm. Zartman & Co	Best spring wagon	$10
H. Pimm	Best carriage painting	$8
Gwinn & Brainerd	Best carriage trimming	$8

SADDLERY AND HARNESS.

Exhibitor.	Article.	Premium.
Gwinn & Brainerd	Best exhibit saddlery	Diploma and $15
Gwinn & Brainerd	Best set double harness	$7 50
Gwinn & Brainerd	Best set single harness	$5
Gwinn & Brainerd	Best saddle	$4
Joseph Ryan	Best exhibit apprentice work	$2 50

PAINTING, ORNAMENTAL WORK, ETC.

Exhibitor.	Animal.	Premium.
Mrs. McCurdy	Best exhibit in classes one and two, by one person, manufactured at any time	Silver pitcher—$25
Edwin Healy	Best specimen of painting in oil on canvas	$5
J. Q. Reed	Best specimen painting in water colors	$3
J. Q. Reed	Best specimen portrait painting in oil	$5
J. Q. Reed	Best collection photographs	$5
Miss Ruby Jewell	Best specimen pencil drawing	$2 50
Miss Ruby Jewell	Best specimen crayon drawing	$2 50
Clarence Healy	Best specimen sketching from nature	$3
Mrs. Ella Ranard	Best specimen hair work	$3
Miss Clara Sehivo	Best and largest variety wax work	$5
Mrs. J. Campbell	Best wax flowers	$3
Mrs. Rutherford	Best wax fruit	$3
Mrs. Rowland	Best specimen shell work	$3
Mrs. Moore	Best specimen bead work	$3
Mrs. Gibbs	Best specimen cone work	$3
Miss Warren	Best specimen moss work	$3
Mrs. Haubrich	Best agricultural wreath	$2 50
R. A. Thompson	Best cabinet of minerals, petrifactions, etc.	$5

AGRICULTURAL IMPLEMENTS.

Exhibitor.	Article.	Premium.
Nash & Cutts	Best fan mill	Special mention.
Geo. Harris	Best fruit dryer	$10

PLANTS, BOUQUETS, ETC.

Exhibitor.	Article.	Premium.
G. B. Pepper	Best collection of trees, shrubs, and flowering plants	$25
E. S. Lippitt	Second best collection of trees, shrubs, and flowering plants	$10
G. B. Pepper	Best exhibit ornamental foliage plants	$10
E. S. Lippitt	Best exhibit fuchsias	$2 50
E. S. Lippitt	Best exhibit geraniums	$2 50
G. B. Pepper	Best exhibit pelargoniums	$2 50
G. B. Pepper	Best exhibit hardy evergreen trees and shrubs for gardens	$2 50
E. S. Lippitt	Best exhibit cactus and cereus	$2
Charles Towne	Best miniature garden	$5
Mrs. S. D. Towne	Best floral design	$5
G. B. Pepper	Best exhibit cut roses	$2
G. B. Pepper	Best exhibit cut dahlias	$2 50

BREAD, CAKES, ETC.

Exhibitor.	Article.	Premium.
Mrs. C. S. Gibson	Best wheat bread	$3
Miss Lucy Haven	Best corn bread	$2 50
Mrs. N. M. Hedges	Best fruit cake	$3 50
Mrs. G. Watson	Best pound cake	$3
Mrs. N. M. Hedges	Best sponge cake	$2 50
Mrs. J. Campbell	Best coffee cake	$2
Mrs. Gibbs	Best assortment tarts	$3

EMBROIDERY, NEEDLEWORK, SEWING, KNITTING, ETC.

Exhibitor.	Article.	Premium.
Mrs. Haubrich	Best exhibit needlework, two varieties	Special mention.
Mrs. McCurdy	Best piece worsted embroidery	$3
Miss F. Lewis	Best tufted worsted work	$2 50
Miss Pimm	Best combed worsted flowers	$2 50
Miss Lodge	Best woven worsted flowers	$2 50
Mrs. Moore	Best silk embroidery on silk or velvet	$3 50
Mrs. Moore	Best silk embroidery on cotton or woolen	$2 50
Mrs. McCurdy	Best cotton embroidery	$2
Miss Lulu Brown	Best chenille work	$3
Mrs. Moore	Best transferred work	$2
Mrs. McCurdy	Best crochet work	$2
Mrs. Moore	Best tatting	$1
Mrs. Moore	Best hemstitching	$2
Mrs. McCurdy	Best Portuguese lace	$3
Mrs. McCurdy	Best Spanish lace	$2
Mrs. R. H. Payne	Best pair woolen stockings	$2
Mrs. R. H. Payne	Best piece knitting	$2
Miss Lulu Brown	Best rag mat	$3
Howe	Best sewing machine for all purposes	Diploma.
Florence	Best sewing machine for fancy work	Diploma.
Mrs. W. A. Lewis	Best machine sewing	$5
Mrs. Thompson	Best lady's dress	$3
Mrs. Elder	Best baby's dress	$2 50
Mrs. Watson	Best boy's suit	$3
Mrs. Moore	Best patchwork	$3
R. H. Payne	Best quilting	$3
Mrs. A. Kelly	Best exhibit millinery	$7 50
Mrs. A. Kelly	Best bonnet	$2
Mrs. J. Campbell	Best washing and ironing	$3
Mrs. Oliver Allen received an honorable mention for an exhibition of ottomans, tidies, etc.; also, for a quilt, the yarn of which she spun and wove into the quilt in girlhood, in eighteen hundred and seventeen. None of the articles were entered for competition.		

SWEEPSTAKES.

Exhibitor.	Article.	Premium.
M. C. Hawley & Co	Best exhibit agricultural implements	$10
A. Kahn	Best exhibit furniture	$10

CHILDREN'S DEPARTMENT.

Exhibitor.	Article.	Premium.
Lulu Brown	Best exhibit needlework, three pieces	$5
Kittie Weston	Best piece worsted embroidery	$2 50
Kittie Weston	Best piece silk embroidery	$2 50
Eva Dalton	Best crochet work	$2
Agnes Humphries	Best tatting	$2
Kittie Weston	Best bead work	$2
Carrie Kelly	Best knitting	$2
Mary Thompson	Best darning	$2
Frankie Shattuck	Best pencil drawing	$2
Frankie Shattuck	Best crayon drawing	$2
Mattie Thompson	Best specimen penmanship	$2
Lucy Haven	Best wheat bread	$2
Katie Button	Best sponge cake	$2

TRANSACTIONS

OF THE

SOLANO AND NAPA

AGRICULTURAL AND MECHANICAL ARTS SOCIETY,

FOR

THE YEAR 1874.

REPORT.

To the honorable the State Board of Agriculture:

GENTLEMEN: In accordance with the provisions of an Act of the Legislature of the State of California—an Act for the encouragement of agriculture and other industries, approved March first, A. D. eighteen hundred and seventy-two—the Board of Managers of the Solano and Napa Agricultural and Mechanical Arts Society herewith submit their annual report for the year eighteen hundred and seventy-four.

INANCIAL EXHIBIT.

Amount of moneys received and expended, as per books of late Secretary, to January 30th, 1874	$25,832 64	
RECEIPTS OF THE LATE FAIR.		
Gate money at Fair grounds	$497 25	
Gate money at Pavilion	227 00	
Receipts from all other sources	2,013 50	
		$2,737 75
DISBURSEMENTS.		
Amount of premiums allowed on stock at Fair grounds	393 00	
Premiums at Pavilion	478 50	
Expenses of conducting Fair, unpaid October 1st	895 58	
Paid out in purses	1,625 00	
Returned entrance money	75 00	
Work on track, etc	188 10	
		$3,655 18
Deficit this year		$917 43
LIABILITIES.		
Notes and interest at Vallejo Bank, dated December 7th, 1873, to October 8th, 1874	$8,165 35	
Bill of B. B. Jackson	1,150 00	
Total debt of society, October 1st, 1874		$10,232 78

The notes and interest at the Vallejo Bank, for eight thousand one hundred and sixty-five dollars and thirty-five cents, are secured by the indorsement of ten of the Trustees of the society.

Respectfully submitted.

J. E. WILLISTON, Secretary.

PREMIUMS AWARDED.

FIRST DEPARTMENT—LIVE STOCK.

CLASS II—HORSES OF ALL WORK.

Exhibitor.	Animal.	Name.	Premium.
L. D. Burgess	Best stallion and four of his colts	Peacock	$15
A. Safely	Best stallion, three years old and over	Granger	$8
G. C. Berry	Best sucking colt	May	$3
Peter Long	Second best sucking colt	Geo. Eclipse	$2

CLASS III—GRADED HORSES.

Exhibitor.	Animal.	Name.	Premium.
L. D. Burgess	Best stallion, three years old or over	Peacock	$10
John Wilson	Best mare, four years old or over	Baltimore Belle	$8
L. D. Burgess	Second best mare, four years old or over	Polly	$4

CLASS IV—DRAUGHT HORSES.

Exhibitor.	Animal.	Name.	Premium.
Thos. Allison	Best stallion, three years old or over	Lakeville Scotchman	$8
John Wilson	Second best stallion, three years old or over	Black Prince	$4
John Wilson	Best mare, three years old or over	Maggie	$6
Edward Frisbie	Second best mare, three years old or over	Nancy	$3

CLASS V—ROADSTERS.

Exhibitor.	Animal.	Name.	Premium.
Edward Frisbie.....	Best stallion, three years old or over..	April Fool.....	.....$8
E. L. Rose.....	Second best stallion, three years old or over.....	Henry Clay, Jr....	.....$4
John Wilson.....	Best mare, three years old or over.....	Kittie Clyde.....	.....$6
P. H. Lennon.....	Second best mare, three years old or over.....	May Lennon.....	.....$3
M. L. Durbin.....	Best gelding, three years old or over..	Rob Roy.....	.....$8

CLASS VI—CARRIAGE AND SADDLE HORSES.

Exhibitor.	Animal.	Name.	Premium.
G. C. McMullin....	Best double-team roadsters, owned and used by the exhibitor.....	Granger and John.	.....$8
A. B. Hill.....	Second best double-team roadsters, owned and used by the exhibitor.....	Billy and Lady....	..... $4
M. L. Durbin.....	Best saddle horse.....	Jennie Ashland...	.....$4
M. L. Durbin.....	Second best saddle horse.....	Pedro.....	.....$2

CLASS VII—THOROUGHBRED CATTLE.

Exhibitor.	Animal.	Name.	Premium.
L. B. Abernathie..	Best bull, three years old or over.....	Idaho.....	.....$15
J. M. Thompson...	Best bull, two years old and under three.....	Gold Dust.....	.....$10
Cannon & Staples.	Second best bull, two years old and under three.....	Red Blood.....	.....$5
L. B. Abernathie..	Best cow, three years old and over.....	Alice	.....$10
Cannon & Staples.	Best bull calf.....	Perfection Second	.....$3
Cannon & Staples.	Best heifer calf.....	Beauty	.....$3
L. B. Abernathie..	Second best calf.....	Mark Twain.....	.....$2

CLASS VIII—GRADE STOCK.

Exhibitor.	Animal.	Name.	Premium.
Cannon & Staples.	Best bull, one year old.....	Ranger	.....$4
Cannon & Staples.	Second best bull, one year old.....	Albion.....	.....$2
Cannon & Staples.	Best heifer, one year old.....	Bessie.....	.....$3
Cannon & Staples.	Best bull calf.....	Peco.....	.....$2
Cannon & Staples.	Best heifer calf.....	Josie.....	.....$2
Edward Frisbie....	Best heifer, two years old.....	Kate...	....$5

CLASS IX—SHEEP.

Exhibitor.	Animal.	Name.	Premium.
Edward Frisbie....	Best Leicester buck.....	.....	.....$8
Edward Frisbie....	Best three Leicester lambs.....	.....	.....$6
R. A. Brantton.....	Best French Merino buck.	.....	.....$8
R. A. Brantton.....	Best two French Merino ewes.....	.....	.....$8
R. A. Brantton.....	Second best two French Merino ewes	.....	.....$5
R. A. Brantton.....	Best three French Merino lambs.....	.....	.....$6
J. B. Hoyt.....	Best Spanish Merino buck.....	.....	.....$8
J. B. Hoyt.....	Best two Spanish Merino ewes.....	.....	.....$8
J. B. Hoyt.....	Second best two Spanish Merino ewes	.....	.....$5
J. B. Hoyt.....	Best three Spanish Merino lambs.....	.....	.....$6
J. B. Hoyt.....	Best two Shropshire ewes.....	.....	.....$8
J. B. Hoyt.....	Best three Shropshire lambs.....	.....	.....$6
J. M. Thompson...	Best Southdown buck.....	.....	.....$8
J. M. Thompson...	Best two Southdown ewes.....	.....	.....$8
J. M. Thompson...	Best three Southdown lambs.....	.....	.....$6

CLASS XI—SWINE.

Exhibitor.	Article.	Premium.
A. T. Hatch.....	Best boar, two years old and over.....	.....$8
R. S. Thompson.....	Best boar, one year old and over.....	.....$6
A. T. Hatch.....	Best boar, six months old and over.....	.....$4
R. S. Thompson.....	Best sow, two years old and over.....	.....$8
R. S. Thompson.....	Best sow, one year old and over.....	.....$6
Cannon & Staples.....	Best pen of pigs, over three and under six months.....	.....$5

CLASS XII—POULTRY.

Exhibitor.	Article.	Premium.
Edward Frisbie.....	Best and largest collection of poultry.....	.....$10
Edward Frisbie.....	Best trio of any breed.....	.....$5
Edward Frisbie.....	Best trio of each distinct breed (nine breeds).....	.....$18
Edward Frisbie.....	Best pair of ducks.....	.....$2
Edward Frisbie.....	Best collection of pigeons.....	.....$3
M. L. Durbin.....	Best pair of lop-eared rabbits.....	.....$1

SECOND DEPARTMENT.

CLASS I—GRAIN, VEGETABLES, ETC.

Exhibitor.	Article.	Premium.
J. M. Thompson	Best exhibit of grain in sheaf	$5
R. E. F. Moore	Best exhibit of potatoes	$5
J. M. Thompson	Second best exhibit of potatoes	$3
Edward Frisbie	Best exhibit of onions	$1
R. E. F. Moore	Second best exhibit of onions	Fifty cents.
R. E. F. Moore	Best exhibit of squashes	$3
Edward Frisbie	Second best exhibit of squashes	$2
R. E. F. Moore	Best exhibit of beans	$1
J. M. Thompson	Best exhibit of sugar beets	$1
Edward Frisbie	Best exhibit of mangel wurtzel	$1
R. E. F. Moore	Second best exhibit of mangel wurtzel	Fifty cents.
R. E. F. Moore	Best exhibit of blood beets	$1
Edward Frisbie	Second best exhibit of blood beets	Fifty cents.
R. E. F. Moore	Best exhibit of carrots	$1
Edward Frisbie	Second best exhibit of carrots	Fifty cents.
Peter Long	Best exhibit of corn on stalk	$1
Edward Frisbie	Second best exhibit of corn on stalk	Fifty cents.
R. E. F. Moore	Best exhibit of cabbage	$1
Edward Frisbie	Second best exhibit of cabbage	Fifty cents.
Edward Frisbie	Best exhibit of parsnips	$1
R. E. F. Moore	Second best exhibit of parsnips	Fifty cents.
Edward Frisbie	Best exhibit of celery	$1 50
Edward Frisbie	Best exhibit of garden vegetables	$5
J. M. Thompson	Best exhibit of muskmelon	$2
Edward Frisbie	Second best exhibit of muskmelon	$1

CLASS II—FRUIT, ETC.

Exhibitor.	Article.	Premium.
M. R. Miller	Largest and best collection of fruits	$10
E. R. Thurber	Second largest and best collection of fruits	$8
J. M. Thompson	Best display of apples	$5
Edward Frisbie	Second best display of apples	$2
J. M. Thompson	Best single variety of apples	$2
J. M. Thompson	Best six varieties of apples	$3
J. M. Thompson	Best collection of pears	$4
Edward Frisbie	Second best collection of pears	$2
M. R. Miller	Best single variety of pears	$2
J. M. Thompson	Best six varieties of pears	$3
R. E. F. Moore	Best collection of plums	$3
R. E. F. Moore	Best single variety of plums	$1
R. E. F. Moore	Best six varieties of plums	$3
Edward Frisbie	Second best six varieties of plums	$1
J. F. Deming	Best display of quinces	$2
M. R. Miller	Largest collection of grapes	$5
M. R. Miller	Best six varieties of wine grapes	$4
M. R. Miller	Best six varieties of table grapes	$4

CLASS III—DRIED FRUITS, PRESERVES, ETC.

Exhibitor.	Article.	Premium.
Mrs. Edward Frisbie..	Best exhibit of dried fruit	$5
Mrs. R. E. F. Moore..	Second best exhibit of dried fruit	$3
Mrs. Edward Frisbie..	Best exhibit of dried apples	$1
J. M. Thompson..	Best exhibit of dried pears	$1
Mrs. Edward Frisbie..	Best exhibit of dried peaches	$1
Mrs. R. E. F. Moore..	Best exhibit of dried plums	$1
Mrs. Edward Frisbie..	Best exhibit of dried apricots	$1
J. M. Thompson	Best exhibit of dried cherries	$1
Mrs. Edward Frisbie..	Best exhibit of dried quinces	$1
Mrs. R. E. F. Moore..	Best exhibit of dried nectarines	$1
Mrs. R. E. F. Moore..	Best exhibit of home-made canned fruit and vegetables	$5
Mrs. Edward Frisbie..	Best exhibit of preserves and jellies	$5
Mrs. R. E. F. Moore..	Second best exhibit of preserves and jellies	$2
Mrs. J. J. Bergin	Best exhibit of pickles and catchup	$3
Mrs. R. E. F. Moore..	Best exhibit of honey in comb	$2

CLASS IV—BUTTER AND CHEESE.

Exhibitor.	Article.	Premium.
G. Braghetta	Best exhibit of butter, six pounds	$8
Mrs. Ed. Frisbie	Second best exhibit of butter	$4
G. Braghetta	Best exhibit packed butter	$5
Mrs. R. E. F. Moore	Second best exhibit of packed butter	$3

CLASS V—WINE, CIDER, ALES, ETC.

Exhibitor.	Article.	Premium.
Pioneer Brewery	Best display	$2
Solano Brewery	Second best display	$1
T. Michaelis	Best exhibit ale	$2
P. McGarvey	Best exhibit soda	$2

CLASS VI—DOMESTIC MANUFACTURES.

Exhibitor.	Article.	Premium.
G. P. Plaisted	Best exhibit of furniture	$2 50
R. E. Hodgkinson	Best exhibit of gloves	$2 50
Vallejo boot and shoe factory	Best exhibit of boots and shoes	$2 50
Vallejo broom factory	Best exhibit of brooms	$2
J. Biggs	Best washing machine	Diploma.
G. P. Plaisted	Best exhibit upholstery	$3
Walter McLeod	Best mechanical display in wood	$5

CLASS VII—CARRIAGES, BUGGIES, AND WAGONS.

Exhibitor.	Article.	Premium.
O. L. Henderson	Best exhibit carriages, wagons, buggies, etc.	Diploma and $5
O. L. Henderson	Best family carriage	$5
O. L. Henderson	Best buggy	$5
O. L. Henderson	Best sulky	$5
O. L. Henderson	Best skeleton wagon	$5
O. L. Henderson	Best express wagon	$5

CLASS VIII—HARNESS.

Exhibitor.	Article.	Premium.
O. L. Henderson	Best set double harness	$5
O. L. Henderson	Best set single harness	$5

CLASS IX—AGRICULTURAL IMPLEMENTS—MADE IN THE DISTRICT.

Exhibitor.	Article.	Premium.
O. L. Henderson	Best harrow	$3

CLASS X—PAINTING, ORNAMENTAL WORK, ETC.

Exhibitor.	Article.	Premium.
Rush Lattin	Best collection of oil paintings	Diploma and $8
A. Gorham	Best specimen California landscape scenery.	Diploma and $5
J. G. Smith	Best collection of photographs	$3
Miss Maggie Brownlee	Best specimen pencil drawing	$4
Miss Belle Codie	Best rag mat or rug	$2
Wheeler & Wilson	Best exhibit sewing machines for all purposes	Diploma and $5
Howe S. M. Co	Second best sewing machines for all purposes.	$3
Howe S. M. Co	Best exhibit sewing machine work	Diploma and $3
Wheeler & Wilson	Second best exhibit sewing machine work	$2
Mrs. S. M. Massey	Best child's dress	$2
Gracie Hilborn	Best patchwork quilt	$3
Mamie C. Perry	Second best patchwork quilt	$1 50
Bella Codie	Best quilting	$2
Mrs. S. M. Massey	Best exhibit of millinery	Diploma and $5
Mrs. S. M. Massey	Best bonnet	$2
W. H. Tripp	Best specimen of penmanship	Diploma and $3
Miss Etta Thompson	Best specimen of waxwork	Diploma and $2

CLASS XI—EMBROIDERY, NEEDLEWORK, ETC.

Exhibitor.	Article.	Premium.
Mrs. A. B. McCarty	Best exhibit of needlework, not less than ten varieties	$5
Mrs. J. M. Thompson	Best piece of worsted embroidery	$5
Mrs. C. J. Mosely	Best worsted picture	$5
Mrs. E. H. Sawyer	Best silk braiding	$5
Mrs. E. H. Sawyer	Best silk embroidery	$5
Mrs. E. H. Sawyer	Best cotton embroidery	$3
Miss Jackson	Best embroidery on lace	$2
Mrs. E. H. Sawyer	Best crochet work	$2
Mrs. E. H. Sawyer	Best tatting	$2
Mrs. E. H. Sawyer	Best hemstitching	$2
Mrs. C. J. Mosely	Best stuffed needlework	$4
Mrs. A. B. McCarty	Best pair woolen stockings	$2 50

CLASS XII—BREAD, CRACKERS, AND CONFECTIONERY.

Exhibitor.	Article.	Premium.
Mrs. R. E. T. Moore	Best exhibit of home-made bread of all kinds, by one woman	$5
Mrs. Ed. Frisbie	Second best exhibit of home-made bread	$3
Miss L. J. Frisbie	Best exhibit of home-made bread, by a miss under sixteen years	$5
Miss Mary Moore	Second best exhibit of home-made bread, by a miss under sixteen years	$3
Mrs. John North	Best exhibit of cakes, by a woman	$5
Miss Mary Moore	Best exhibit of cakes, by a miss under sixteen years	$5
Mrs. R. E. T. Moore	Best exhibit of tarts, by a woman	$3
Miss Mary Moore	Best exhibit of tarts, by a miss under sixteen years	$3
G. A. Blank	Best exhibit of confectionery	Diploma and $2

CLASS XIV—CHILDREN'S DEPARTMENT (FOR CHILDREN UNDER SIXTEEN YEARS).

Exhibitor.	Article.	Premium.
Gracie Hilborn	Best patchwork quilt	$3
Mamie C. Perry	Second best patchwork quilt	$1 50

TRANSACTIONS

OF THE

SISKIYOU COUNTY AGRICULTURAL SOCIETY,

FOR

THE YEAR 1874.

REPORT.

To the honorable the State Board of Agriculture of the State of California:

GENTLEMEN: The Board of Directors of the Siskiyou Agricultural Society, as required by law, respectfully submit the annexed report of the transactions of the society for the year eighteen hundred and seventy-four, including a list of articles exhibited and premiums awarded, the amount of receipts and expenditures, and the objects for which such expenditures have been made.

It is gratifying to state that this was decidedly the best exhibition that the society has ever held, the attendance being large, and represented from all parts of the county. Too much cannot be said in praise of the ladies who so kindly assisted in decorating the Pavilion, and the Dramatic Amateur Troupe, who performed every night gratuitously for the society's benefit. On the whole, everybody went away pleased, and left us in the same fix.

JAMES QUINN, Secretary.

FINANCIAL REPORT.

The following is a list of the receipts and expenditures of the Siskiyou County Agricultural Society for the past year, including the Fair, with a correct list of the cash premiums awarded:

	RECEIPTS.	
January 17...	To balance on hand	$1,048 01
	Wm. McConnell	160 00
	E. C. Spannaus	10 00
October 10...	Entrance on ten-mile race	75 00
	Theater and ball	581 00
	Bar	624 00
	Entrance races	440 00
	Saddles sold	60 50
	Gate money	275 00
	Stock entries	87 00
	Pools	80 50
	Licenses	60 00
	Badges	495 00
	Rent	122 00
	Total	$4,113 01
	EXPENDITURES.	
	Wm. H. Morgan, taxes	$18 87
	J. P. Woods, premium	20 00
	E. & H. Wadsworth, sundries—persons who worked on track	287 75
	L. Monnet, school tax	7 00
	L. Swan, labor	8 00
	E. & H. Wadsworth, freight on reports	19 50
	E. C. Spannaus, entrance refunded	10 00
	Track Committee	8 00
	Thomas Campbell, laborer	6 00
	Colt stake	690 00
	Purse	135 00
	Purse	315 00
	Difference in ten-mile race	70 00
	Race	94 00
	Two-mile and repeat race	315 00
	Walking race	31 00
	City taxes	2 70

Telegraphing	$ 75
P. G. Strickland, amateurs	150 00
E. & H. Wadsworth, interest, etc	30 28
Barlow, Sanderson & Co	25 00
Wm. Hutchinson	60 59
S. Magoffey, licenses	16 10
Thomas Williams, hauling	2 00
Mrs. Sheppard, premium	1 00
C. D. Fowle, saddle	26 00
C. Peters, merchandise	24 00
James Wheeler, merchandise	10 00
Charles Breton, merchandise	16 50
F. Reid, laborer	1 50
Ad. Winckler, merchandise	26 25
Charles Junker, merchandise	24 00
Telegraphing	2 25
Truitt and Young, labor	40 00
John Pashburg, merchandise	74 50
Theo. Young, merchandise	9 00
McConnell & McManus, merchandise	45 54
B. Guilbert, merchandise	49 50
A. Lee, labor	12 30
L. Swan, hay	26 75
Thomas Campbell, labor	12 00
Flintner & Dumas, hay	15 75
H. Truitt, music	20 00
Raynes & Pyle, merchandise	14 14
R. Nixon, printing	41 50
Union office, printing	20 00
F. J. King, merchandise	13 00
G. M. Lawton, labor	24 00
E. Green, labor	62 25
O. M. Schwatka	47 00
County licenses	6 00
Joseph Lang	3 50
William Cooley, labor	10 00
E. Autenrieth, labor	25 00
A. Alvanley, labor	7 50
B. F. Smith, labor	15 00
William Irwin, printing	23 50
E. Ranous, labor	21 65
H. B. Warren, material	8 50
L. Huseman, merchandise	8 12
Cleland & Walbridge	4 50
J. Churchill, merchandise	3 25
Kessler & Son, merchandise	42 30
Kessler & Son, merchandise	50 00
Franco American	8 75
J. W. Bird	5 25
Wm. H. Harrison, draying	8 00
James Irwin, labor	10 00

Yreka Gas Company	$5 00
James Irwin, labor	2 00
Kessler & Son	8 00
J. W. Bird	3 00
E. H. Autenrieth, material	6 25
Stewart & Lawton, labor	30 00
Wm. Hutchinson	10 00
J. Davis, premium	5 00
Mrs. M. E. Hilt, premiums	62 50
Sam. Jackson, premium	20 00
H. L. Davis, premium	10 00
J. A. Davidson, premium	13 50
C. S. Moore, premium	5 00
E. Reichman, premium	5 00
Eddy McConnell, premium	3 00
J. R. Kenyon, special premium	1 00
F. J. King, salt	5 00
Mrs. J. Clarkson, premium	10 00
Mrs. Jesse Davis, premium	7 00
Mrs. Henry Hazlitt, premium	3 00
Mrs. J. Martin, premium	5 00
Mrs. M. Fultz, premium	8 00
Mrs. J. W. Evans, premium	2 00
Miss Louisa Fried, premium	1 00
Mrs. H. L. Davis, premium	3 50
Mrs. E. Chandler, premium	17 00
Mrs. Iffland, premium	8 50
Mrs. Nordheim, premium	1 00
Wm. McConnell, cheese	5 00
Miss A. Ryan, premium	1 00
Miss Jenny Clyde, premium	1 00
Joseph Lang, premium	3 50
B. F. Smith, premium	10 00
Miss Nattie King, premium	2 50
Master Alexander Rosborough, premium	2 50
Miss Maggie Combs, premium	5 00
Miss Mary Stringham, premium	5 00
Mrs. Inez Wheeler, premium	6 00
Miss Mary Combs, premium	2 50
Mrs. A. W. Niles, premium	5 00
Mrs. E. Ranous, premium	3 00
Miss Katie Brown, premium	2 00
Miss Mary Wetzell, premium	2 00
Miss Mary Pashburg, premium	1 00
Miss Tena Klinge, premium	1 00
Miss Martha Knights, premium	1 00
Miss Katie Remme, premium	1 00
Miss Mary Nixon, premium	1 00
Sisters of Mercy, premium	2 00
Miss Anna Kelch, premium	2 50
Miss Lena Bisbee, premium	1 00
Miss Sophie Winckler, premium	1 00
Miss Carrie Jones, premium	1 00

Miss Katie Junker, premium	$1 00
Mrs. F. Taylor, premium	1 00
Miss Clara Seavers, premium	2 00
Mrs. Pashburg, premium	1 00
Mrs. Klinge, premium	1 00
Miss Mary Greenough, premium	1 00
Miss Minnie Winckler, premium	1 00
Mrs. Bisbee, premium	1 00
Mrs. S. Autenrieth, premium	1 00
Miss Minnie Kaster, premium	1 00
Miss Ida Ranous, premium	1 00
Mrs. Wm. McConaughy, premium	2 00
Mrs. F. Rogler, premium	1 00
Miss Laura Calhoun, premium	1 00
Mrs. C. F. Hammond, premium	2 50
Mrs. D. Horn, premium	2 00
Mrs. Charles Munroe, premium	2 50
Charles Peters, lager	5 00
Mrs. P. C. Call, premium	2 50
Ike Reynolds, premium	30 00
G. A. Nordheim, material	1 50
C. F. Hammond, premium	35 00
James Quinn, premium	55 00
E. Flitner, premium	15 00
J. B. Wortser, premium	25 00
Amadee, premium	10 00
J. B. Rohrer, premium	12 50
E. J. Winegar, premium	15 00
G. W. Gimple, premium	15 00
W. McConnell, premium	10 00
D. Deter, premium	70 00
James Davidson, premium	25 00
J. R. Kenyon, premium	62 50
J. P. Woods, premium	15 00
H. B. Gillis, services	25 00
F. Ringe, saddle	27 00
Mrs. Louisa Hart, premium	1 00
James Quinn, salary	50 00
Vance & Nehrbass, material	11 50
J. R. Patterson, hay	14 00
Total	$4,128 04

WM. McCONAUGHY,
JOHN V. BROWN,
P. G. STRICKLAND,
JAMES QUINN,
Finance Committee.

JAMES QUINN, Secretary.

NINTH ANNUAL FAIR.

The ninth annual Fair of the Siskiyou County Agricultural Society was largely attended by our citizens from all parts of the county, and there were more present on the first day, and, in fact, every day, than we have seen at any Fair yet held in the county. The great colt race of the first day attracted many visitors, who took a great interest in the colts trained especially for this race. The double team race and other races, and the stock display, passed off with general satisfaction. At the Pavilion the display of fruit and vegetables was about the best and largest we have ever witnessed here, and the exhibition of fancy articles, paintings, mechanical skill, etc., was fully equal to any former display, the number of entries in the Pavilion being nearly double the number of last year, while many articles came in too late or were not entered for premiums, which do not appear in the list, although left at the Pavilion for exhibition. The Fair this year was a grand success in almost every particular, and shows that the people generally are determined to maintain the efforts of the Agricultural Society, in fostering a competition towards improving our products, mechanical skill, and fine stock, which branches of industry build up a country in prosperity and greatness. The proceedings of the week at the Park and Pavilion we give as follows:

AT THE PARK.

THE RACES—FIRST DAY.

The first race, at the opening of the Park races, was the great colt race for eighteen hundred and seventy-four, to be run by colts foaled in eighteen hundred and seventy-one, which, with society purse of two hundred and fifty dollars, and the entrance fees accumulating since that time, added to purse, made the stake amount to six hundred dollars. There were sixteen colts originally named, which number had dwindled down to six on day previous to race, and on day of race only three colts appeared on the track, to wit: L. Swan's b. c. Idyl, by Frank Tolman; J. A. Davidson's b. c. Siskiyou, by Lancet; Sam. Magoffey's br. filly Siskiyou Girl, by Gladiator. The Judges for the day were W. A. Farish, James Vance, and P. G. Strickland; Timers, Brit Irwin and B. F. Smith; Patrols, H. Richardson, J. G. Halleck, I. S. Mathews, and H. L. Davis; Distance Judges, J. C. Burgess and Al. Peacock. The track was in very good condition, except being rather hard from the effects of the late rain. The colts drew positions as follows: Idyl inside, with L. Swan as driver; Siskiyou second, with L. F. Smith as driver; and Siskiyou Girl outside, with Sam. Magoffey as driver. After some six or seven efforts to start, the colts were tapped off, Siskiyou and Siskiyou Girl about even, and Idyl a little behind, the latter being a little behind at the stand on nearly every trial. For a short distance all kept

their position, Idyl beginning to fall behind at first turn, while Siskiyou Girl shot ahead, passing the first quarter several lengths ahead of the other colts, making the first quarter in forty eight seconds. Siskiyou Girl broke and lost a little going up the back stretch, reaching the half-mile pole in one minute and thirty-six and one half seconds, with the others some distance behind. Siskiyou Girl made the three-quarter pole in two minutes and twenty-three seconds, and after breaking a little down the homestretch, reached the stand in three minutes and twelve and one quarter seconds, taking all the money, by the other colts being distanced and shut out of second and third money. It is evident that Idyl did not perform as well in this race as usual, and may yet turn out a superior trotting nag. Siskiyou Girl is a fine animal, and is destined to make her mark on the turf in every contest where she may take part. Siskiyou is also a fine young horse, easily managed, and true in going to the best of his ability on every occasion, a fact well shown in his promptness in starting.

The second race was a running race, single dash of one mile, free for all two-year-olds; purse, one hundred dollars; entrance, twenty-five dollars, added. Ben. Franklin named bl. filly "Nell. Flaherty," and E. Flitner named b. f. "Dolly Varden"—both by Gladiator. Both colts started off together on first trial, and kept together all the way round, until half way down the homestretch, Dolly taking the inside a short distance before reaching the stand, causing Nell. to jump back and take the outside, Dolly coming under the string about two lengths ahead, making the mile in 2:30. The rider of Nell. entered a complaint of foul riding by the rider of Dolly taking the inside and impeding his colt, the rider of Dolly replying that his colt bolted. The Judges decided that the riding was foul, though unintentional, and ordered another trial, giving the colts twenty minutes to cool off, which decision was received with shouts of satisfaction. Ben. Franklin, the owner of Nell. Flaherty, claimed the purse, but would run again under protest. The colts started off again, and kept side by side most of the time until coming down the homestretch, when Dolly gained, and came under the string nearly three lengths ahead; time, 2:55. The Judges declared in their opinion that Dolly won the race and purse, but in view of the protest entered by the owner of Nell. Flaherty, the decision would be considered and given hereafter. Franklin soon after withdrew his claim and protest, and the Judges then gave the race and money to Dolly Varden.

SECOND DAY.

The first race was ten miles out, for double teams; purse, one hundred dollars; entrance, fifty dollars; Judges—Swan, Magoffey, and Strickland. There were three entries, as follows: David Horn's black team of Gladiators, driven by owner; Thomas McGrath's sorrel team, driven by owner; William McConnell's brown team—Sam. and Frank—driven by James Driscoll. Horn's team drew the inside; McConnell's the center, and McGrath outside. The horses started off well, Horn's team breaking up and losing a little, while McConnell's team came in ahead, on first mile, with McGrath's team a little behind; time, 4:30. The second mile was made in 4:35, McConnell's team first, and McGrath second. The third mile was made in same order; time, 3:40. On the fourth mile, McGrath's team closed the gap, and came to the stand even with McConnell's team; time, 4:15. The fifth mile was made in 4:17. In the sixth mile, McGrath's sorrels passed McConnell's team, coming in at the

Judges' stand a little ahead; time, 4:17, which position they held for the last five miles. The seventh mile was made in 4:17, and the eighth in 4:20. McConnell's team broke up badly in the ninth mile, McGrath's team coming in ahead by several lengths; time, 4:17. On the tenth mile McConnell's team did considerable running, while McGrath's team trotted fairly, and came in several lengths ahead, winning race and money; time, 4:20. Total time for ten miles, 43:30. Horn's team, although nearly three quarters of a mile behind, was awarded second money, McConnell's team being placed last for foul driving, or running about half way around the track. This race excited considerable interest, and a very large attendance witnessed it; and at the close there were strong indications of a free fight over some dissatisfaction in reference to foul driving, as decided by the Judges.

SUMMARY.

McConnell's team.....	1	1	1	1	1	2	2	2	2	2
McGrath's team.....	2	2	2	2	2	1	1	1	1	1
Horn's team.....	3	3	3	3	3	3	3	3	3	3

The next race was a trotting match, mile heats, three in five, free for all; purse, one hundred and fifty dollars; entrance, twenty five dollars. Colonel E. J. Winegar names br. g. "Pompey," driven by L. F. Smith, and Wm. McConnell names b. g. "Tip Ward," driven by James Driscoll. Race won by Pompey in three straight heats; time, 3:01, 2:57, and 2:54. The Judges gave "Pompey" all the purse, declaring "Tip Ward" distanced, for foul driving on third heat.

THIRD DAY.

The programme of exercises at the Park this day opened with parade of stock, and award of premiums, to wit:

HORSES.

Exhibitor.	Animal.	Premium.
	Thoroughbred horses.	
Isaac A. Reynolds.....	Mare Mary Tompkins, six years old.....	.....$10
	Roadsters.	
Wm. McConnell.....	Gelding Frank.....	.....
E. J. Winegar.....	Gelding Pompey, eight years old.....	.....$15
David Horn.....	Double team, Gladiators.....	.....
Wm. McConnell.....	Double team, Frank and Tip Ward.....	.....$10
Sam. Magoffey.....	Mare Siskiyou Girl, three years old, by Gladiator.....	.....
G. W. Gamble	Sorrel mare Lady Clyde, four years old.....	.....$15
	Graded horses.	
I. A. Reynolds.....	Yearling colt, Lady Clara, by Norfolk; dam, Hunkadora.....	.....$5
I. A. Reynolds.....	Suckling colt, six months old, sire, Norfolk; dam, Hunkadora	.....$5

HORSES—Continued.

Exhibitor.	Animal.	Premium.
C. F. Hammond	Mare Alamode, sire Rifleman; dam, unknown; and suckling colt five and a half months old	$15
J. P. Woods	Stallion Rochester, by Gladiator, six years old	$20
J. P. Woods	Stallion Kirby Smith, by Gladiator, nine years old	
James Quinn	Stallion New York, by Abdallah, two years old—imported	$10
E. Flitner	Mare Queen of Hearts, by Gladiator, four years old	$5
E. Flitner	Filly Dolly Varden, two years old, by Gladiator	
John B. Rohrer	Suckling colt, Breckenridge, four months old.	$2 50
	Horses of all work.	
Amadee	Stallion Billy, three years old, sired by Frank Tolman	$10
	Families.	
C. F. Hammond	Mare Alamode, sire Rifleman; Mary Tompkins, six years; Lancet, three years; Kate Kirby, five and a half months old	$20
J. B. Wortser	Stallion Kirby Smith, with Kate Kirby, Fanny Meuse, and suckling colt Robert Russell	$25
Ed. Bean	Mare Flora Temple, with Robert Russell, suckling colt, Kate Kirby, five months old, and Kate Meuse, five months old	$25

Committee on Horses—O. C. Wheeler, Wm. Bybee, and Louis Tucker.

CATTLE.

Exhibitor.	Animal.	Premium.
	Devons.	
Russ Kenyon	Bull Durbenham, two years old	$15
Russ Kenyon	Cow Daisy, seven years old	$20
Russ Kenyon	Cow Rabbit, three years old	$15
Russ Kenyon	Cow Alamode, one year old	$7 50
Russ Kenyon	Heifer calf, suckling, Rosalin	$5
	Ayrshire.	
James Quinn	Bull New York, three years old	$20

CATTLE—Continued.

Exhibitor.	Animal.	Premium.
	Durhams.	
James A. Davidson	Bull Copay, six years old	$25
David Deter	Bull Stonewall, three years old	$20
David Deter	Bull 5th Duke of May, two years old	$20
David Deter	Heifer, Belle of Yuba, two years old	$10
David Deter	Suckling calf, three weeks old	$5
	Graded.	
James A. Davidson	Bull Siskiyou, eighteen months old, half Devon	
J. P. Woods	Bull Derby, two years old	$15
Russ Kenyon	Cow Pink, sired by 3d Duke of Devon	
John B. Rohrer	Cow Jane, three years old, with calf three months old, best cow of any age	$10

Committee on Cattle—W. J. Segrams, H. Burnham, and Chris. Johnston.

SHEEP—MERINO.

Exhibitor.	Animal.	Premium.
James Quinn	Ram Sam, four years old	$10
James Quinn	Ram Dandy, seven months old	
James Quinn	Ewes Peggy and Lucy, three years old	$15
James Quinn	Ewe Mary Jane, seven months old	$5

Committee on Sheep—O. C. Wheeler.

Trotting race, three-year-olds, best two in three; purse, seventy-five dollars; entrance, twenty dollars. Judges—Jesse Davis, L. Swan, and James Vance. E. Flitner named "Lantern," by Lancet, dam Alamode; Wm. Eckhart named "Bay John," by Frank Tolman; P. G. Strickland named "Black Cloud," by Lancet, dam Sligart. Race won by Black Cloud, in two straight heats; time, 4:01 and 3:45. The horses were called up, and started for first heat on second scoring, at the word. Black Cloud was behind, but his driver requested a start. At the start it seemed that Black Cloud meant mischief, as the driver had hard work on first quarter to keep him from bolting or kicking. On back stretch all the horses were in a huddle. At half-mile pole, Black Cloud shot ahead of Bay, and about half way between half-mile pole and three-quarter, Black Cloud pushed his nose ahead of Lantern, holding it to the out-

come, winning the heat by two open lengths. Second heat, horses got off at the word. Black Cloud still meant mischief to the first quarter. Flitner's horse got ahead and took inside. Black Cloud then settled down to his work and took the lead and inside in a few strides, holding it to the outcome, the other horses barely getting clear of being distanced. Bay John took second money.

FOURTH DAY.

The race this day was a running race, two-mile heats, free for all; purse, two hundred dollars; entrance, fifty dollars. Judges—L. Swan, James Vance, and P. G. Strickland. The following horses were entered: J. P. Woods, brown stallion Rochester, by Gladiator; James Reynolds, bay mare Mary Tompkins, by Norfolk, dam Alamode, full sister to Minnie Rifle. S. S. Ford, sorrel gelding Rattling Jack, by Independent Boston, dam Red Fox. The horses drew positions, Rochester inside, and rode by Judd; Rattling Jack, second, rode by A. Witherill; Mary Tompkins, outside, rode by T. Franklin. Horses started on second scoring, Jack taking lead, Mary overtaking him, and passing under the string a little ahead on first mile. After passing the stand Jack shoved ahead before reaching first quarter, gaining two lengths, and keeping it until the outcome. Rochester distanced; time, 3:57. In second heat, horses started on first scoring, Jack inside and Mary outside. At first quarter Jack was two lengths ahead, Mary gaining a length on back stretch, holding this position until clear round to back stretch of second mile, and taking the lead on three-quarter stretch, coming down the home stretch at a fearful rate, Jack making a brush close to the stand, and both horses passing under the string even; time, 4:01½. After calling out for next heat, the owner of Jack, seeing that he was disabled by bursting or cutting his right forefoot very badly, causing him to limp, asked permission to withdraw him. Mr. Ford wished it understood that if the Judges and friends considered the horse able to run, that Jack should go if it killed him, but he deemed it cruelty to run him in his disabled condition. The horse's foot was examined by the Judges and others, and it seemed to be the general consent of all, that it was nothing but right that Ford be allowed to withdraw his horse. The race and money was then awarded to Mary Tompkins. Those two animals showed good grit, and it was a great disappointment to many who become much interested, as it was a hard matter to tell which would win. Rattling Jack met with a similar accident a few years ago in running against Kirby Smith, and it may possibly be a couple of years before he is able to make a race again. Mary Tompkins is a larger and heavier horse than Jack, and from the test shown, is competent to compete with any horse on this coast in a running race.

Second race, walking match, one mile out, purse twenty-five dollars, entrance, five dollars, added. William McConnell named White Cloud, a little white horse. J. P. Woods named Bald Hornet, a good sized bay horse. The riders were ordered to go, but demanded to be given their positions, which caused much fun. White Cloud was given the inside and Bald Hornet the outside. Both horses started from a standstill, and at first quarter White Cloud was at least one hundred feet ahead, little Whitey making short quick steps, while the bay, not satisfied with walking, went very slow. White Cloud won the race, coming in about a

quarter of a mile ahead, creating considerable sport in the way of burlesque, the winning horse being escorted around by a squad of small boys. Time, eleven minutes and fifteen seconds.

A second walking race was made for a saddle, between White Cloud and Steve Ford's Bumble Bee, in which White Cloud about distanced Bumble Bee. No time kept.

AWARD OF PREMIUMS.

The following is a list of premiums awarded at the Pavilion:

COMMITTEES.

On Leather—Jessie Davis, H. Richardson, and H. B. Gillis.

On Fruit, Grain, Vegetables, Flour, and Poultry—L. D. Ladd, J. F. Whitter, and J. A. Shepard.

On Canned Fruits, Jellies, and Preserves—Mrs. C. H. French, Mrs. L. R. Warren, Mrs. A. Winckler, and Mrs. Thomas Orr.

On Dried Fruits—Mrs. L. Huseman and Mrs. A. E. Schwatksnodd.

On Butter, Honey, and Cheese—Mrs. E. Heard, Mrs. Bills, and Mrs. Perry Hoyt.

On Bread and Cake—Mrs. J. R. Kenyon, Mrs. J. Martin, and Mrs. H. C. Tickner.

On Fine Needlework and Silk Embroidery—Mrs. C. D. Fowle, Mrs. J. Cavanaugh, and Mrs. Bartlett.

On Patchwork and Quilting—Mrs. L. Hart and Mrs. G. M. Lawton.

On Fancy Articles—Mrs. Sterling, Mrs. Stringham, and Mrs. Linton.

On Home-made Wool, Yarn, and Knitting—Mrs. Beaughan, Mrs. E. Chandler, and Mrs. G. A. Nordheim.

On Cut Flowers—Mrs. Bartlett, Mrs. F. Ringe, and Mrs. Jessie Davis.

PREMIUMS AWARDED.

GRAIN, VEGETABLES, ETC.

Exhibitor.	Article.	Premium.
Jesse Davis	Best fifty pounds wheat	
Mrs. M. E. Hilt	Best fifty pounds beans	
Mrs. M. E. Hilt	Best fifty pounds hops	
Sam. Jackson	Best fifty pounds corn	
H. L. Davis	Best fifty pounds oats	
H. L. Davis	Best fifty pounds barley	
J. A. Davidson	Best fifty pounds onions	
J. A. Davidson	Best fifty pounds rye	
C. S. Moore	Best fifty pounds carrots	
J. A. Davidson	Best fifty pounds potatoes	
E. Reichman	Best fifty pounds flour	
Master Ed. McConnell	Dark Brahma chickens	
Mrs. M. E. Hilt	Blooded Dominique chickens	
Sam. Jackson	Hubbard squash	
C. S. Moore	Yankee pumpkin	
J. A. Davidson	White sugar beet	
J. A. Davidson	Drumhead cabbage	...Spec. prem. rec.
J. R. Kenyon	Golden ball turnips	...Spec. prem. rec.
F. J. King	Packing salt	...Spec. prem. rec.
Mrs. M. E. Hilt	Tomatoes	...Spec. prem. rec.

FRUITS.

Exhibitor.	Article.	Premium.
Mrs. M. E. Hilt	Late crimson peaches	
Mrs. J. Clarkson	Best variety of plums	
Mrs. M. E. Hilt	Grapes	
Mrs. M. E. Hilt	Best ten varieties of apples	
Sam. Jackson	Best three varieties of apples	
Mrs. M. E. Hilt	Best five varieties of pears	
Henry Hazlitt	Best three varieties of pears	
Mrs. M. E. Hilt	Raisins	...Spec. prem. rec.

CURED MEATS.

Exhibitor.	Article.	Premium.
Sam. Jackson	Best bacon—ham, shoulders, and side	

JELLIES.

Exhibitor.	Article.	Premium.
Mrs. J. Clarkson	Wild cherries	
Mrs. J. Clarkson	Wild plums	
Mrs. Jesse Davis	Apple jelly	
Mrs. Jacob Martin	Red currant jelly	
Mrs. M. E. Hilt	Peach syrup	
Mrs. M. Fultz	Plum jelly	
Mrs. M. Fultz	White currant jelly	
Mrs. Louisa Hart	Crabapple jelly	
Mrs. M. E Hilt	Blackberry jelly	
Mrs. M. Fultz	Cherry jelly	

CANNED FRUITS.

Exhibitor.	Article.	Premium.
Mrs. M. Fultz	Tomatoes	
Mrs. Jessie Davis	Blackberries	
Mrs. M. E. Hilt	Crimson peaches	
Mrs. M. E. Hilt	Apples	
Mrs. M. E. Hilt	Quinces	
Mrs. J. Martin	Cherries	
Mrs. J. Martin	Currants	
Mrs. M. E. Hilt	Grapes	
Mrs. M. Fultz	Yellow peaches	
Mrs. M. E. Hilt	Pears	
Mrs. W. J. Evans	Plums	
Mrs. Jessie Davis	Gooseberries	

PRESERVES.

Exhibitor.	Article.	Premium.
Mrs. A. Iffland	Apricots	
Mrs. J. Clarkson	Peaches	
Mrs. Jessie Davis	Plums	
Mrs. J. Clarkson	Currants	
Mrs. J. Clarkson	Crabapples	

PICKLES.

Exhibitor.	Article.	Premium.
Miss Louisa Fried (fourteen years old)	Pickled cabbage	
Mrs. M. E. Hilt	Cucumber pickles	
Mrs. M. E. Hilt	Pickled peaches	
Mrs. H. L. Davis	Tomato pickles	
Mrs. Jessie Davis	Walnut mangoes	
Miss E. Chandler	Mango peppers	
Mrs. M. Fultz	Tomato catchup	
Miss E. Clyde (eleven years old)	Spiced currants	
Mrs. G. A. Nordheim	Potato starch	

BUTTER, CHEESE, ETC.

Exhibitor.	Article.	Premium.
William McConnell	Cheese made by J. W. Wetmore, of Scott Valley	
Mrs. M. E. Hilt	Firkin butter	
Mrs. E. Chandler	Best sixty pounds of fresh butter	
Mrs. E. Chandler	Best ten pounds of honey	
Mrs. E. Chandler	Best beeswax	Special premium.
Thomas Orr	Honey	Special premium.

DRIED FRUITS.

Exhibitor.	Article.	Premium.
Mrs. M. E. Hilt	Greatest number and variety of best specimens	
Mrs. J. Clarkson	Second greatest variety	Special premium.

BREAD, CAKES, ETC.

Exhibitor.	Article.	Premium.
Miss Anna Ryan (twelve years old)	Soda biscuit	
Mrs. A. Iffland	Pound cake	
Miss J. Clyde (eleven years old)	Domestic bread	
Joseph Lang	Baker's bread	
Joseph Lang	Crackers	

FINE ARTS.

Exhibitor.	Article.	Premium.
B. F. Smith	Landscape painting, Castle Rock	
B. F. Smith	Painting of Mount Shasta	
Miss Nettie King (fourteen years old)	Oil painting	
Alexander Rosborough	Pencil drawing	
Mrs. A. W. Niles	Pencil drawing	

QUILTS, ETC.

Exhibitor.	Article.	Premium.
Miss Maggie Combs	Patchwork quilt	First premium.
Mrs. E. C. Chandler	Patchwork quilt	Second premium.
Mrs. Mary Stringham	Worsted quilt	
Mrs. Inez Wheeler	Silk quilt	
Miss Mary Combs	Child's quilt	
Mrs. Thomas Orr	Worsted quilt	Diploma.
Mrs. A. W. Niles	Crib quilt	Hon. mention.
Mrs. A. W. Niles	Drawed hearth rug	
Mrs. E. Ranous	Braided hearth rug	
Mrs. David Horn	White quilt	Hon. mention.

FANCY WORK.

Exhibitor.	Article.	Premium.
Miss Mary Wetzel (nine years old)	Crochet tidy	First premium.
Miss Louisa Fried	Crochet tidy	Hon. mention.
Miss Kate Brown	Tatting collar	Premium.
Miss M. Pashburg (five years old)	Crochet curtain holders	Premium.
Miss Tena Klinge (six years old)	Cotton crochet	Premium.
Miss M. Knights (ten years old)	Worsted embroidery	Premium.
Miss Emma Clyde (thirteen years old)	Child's afghan	Hon. mention.
Miss K. Remme (twelve years old)	Bead pincushion	Second premium.
Miss Mary Nixon (seven years old)	Book marks	First premium.
Sisters of Mercy	Bead embroidery	First premium.
Miss A. Kelch (eleven years old)	Braided child's suit	First premium.
Miss Lena Bisbee (nine years old)	Embroidered tidy	Premium.
Miss Sophie Winckler	Bead hanging basket	Premium.
Miss Carrie Jones (nine years old)	Air castle	Premium.
Miss Nellie Heard	Horn basket	Diploma.
Mrs. Joseph Lang	Rose geranium	Diploma.
Mrs. Joseph Lang	Vine in hanging basket	Hon. mention.
Miss Katie Junker	Picture in raised work	First premium.
Mrs. A. W. Niles	Worsted lamp mat	First premium.
Mrs. F. Taylor	Rose and lily tidy	First premium.
Mrs. Inez Wheeler	Raised crochet work, tidy	Second premium.
Sisters of Mercy	Raised worsted work	First premium.
Miss Clara Seavers	Daisy mat	First premium.
Mrs. John Pashburg	Cotton crochet tidy	First premium.
Mrs. A. Klinge	Crochet night cap	First premium.
Miss Mary Greenough	Crochet edging	First premium.
Miss Minnie Winckler	Knot work	First premium.
Mrs. W. Bisbee	Slipper case applique	First premium.
Mrs. S. Autenreith	Watch case	First premium.
Miss Minnie Kaster (five years old)	Bead mat	First premium.
Miss Ida Ranous	Knitted lace	First premium.
Mrs. A. W. Niles	Shell basket	First premium.
Mrs. Wm. McConaughy	Infant's robe	
Mrs. M. E. Hilt	Cone and shell basket	Hon. mention.
Mrs. A. Iffland	Child's dress, silk embroidery	First premium.
Mrs. H. B. Warren	Silk embroidery	Hon. mention.
Mrs. Dowling	A doll	Hon. mention.
Mrs. F. Rogler	Netted and darned table cover	First premium.
Miss Laura Calhoun	Java canvas tidy	First premium.
Miss Laura Calhoun	Crochet tidy	Second premium.
Mrs. Inez Wheeler	Worsted lamp mat	First premium.

NEEDLE WORK BY HAND.

Exhibitor.	Article.	Premium.
Mrs. C. F. Hammond	Child's apron	First premium.
Mrs. C. F. Hammond	Child's suit of underclothes	Second premium.
Mrs. C. F. Hammond	Child's braided suit	Diploma.
Mrs. C. F. Hammond	Lady's suit of underclothing	First premium.
Mrs. David Horn	Gents' drawers and undershirts	Special premium.
Mrs. David Horn	Gentleman's shirt	Hon. mention.
Mrs. M. E. Hilt	Pique apron	Special premium.
Mrs. M. E. Hilt	Calico apron	Special premium.
Miss K. Remme (twelve years old)	Pillow slip and toilet cover	First premium.
Miss Mary Witherill (eleven years old)	Suit of underclothing	Second premium.

MACHINE WORK.

Exhibitor.	Article.	Premium.
Mrs. Charles Munro	Chemise	First premium.
Mrs. C. F. Hammond	Child's night dress	Second premium.
Mrs. David Horn	Lady's suit of underclothing	Hon. mention.

CUT FLOWERS.

Exhibitor.	Article.	Premium.
Mrs. Van Choate	Greatest variety of fine flowers	
Mrs. W. Bisbee	Most beautiful bouquet of roses in color and variety	First premium.
Mrs. W. Bisbee	Most beautiful coxcomb	
Mrs. Van Choate	Most beautiful collection of flowers, pansies	First premium.
Miss Mary Green	Finest display of dahlias	
Miss Mary Greenough	Two vases of mixed flowers	
M. S. Sisson	Two Winter bouquets of dried flowers	First premium.
Miss Clara Hovey	Vase of purple amaranths	Diploma.

LAGER, WINES, ETC.

Exhibitor.	Article.	Premium.
Charles Peters	Yreka Brewery	
C. S. Moore	Currant wine of 1869	
Mrs. H. L. Davis	Currant wine, three years old	
Mrs. H. L. Davis	Raspberry wine	
Mrs. M. E. Hilt	Currant wine	
Mrs. M. E. Hilt	Blackberry wine of 1873	
Mrs. M. E. Hilt	Grape wine	
Mrs. M. E. Hilt	Blackberry wine	
Mrs. M. E. Hilt	Brandy peaches	
Mrs. P. C. Call	Cider vinegar	

ENTRIES AT THE PAVILION.

The following is a list of entries for premiums at the Pavilion of County Fair:

C. Schlicht, sack of flour.

Samuel Jackson, corn on the stalk; three varieties of squashes; one of pumpkins, and one of cucumbers; six varieties of corn; a lot of beans; five varieties of potatoes; fourteen varieties of apples; four varieties of peaches; eight varieties of beans; and a ham, shoulder, and side of bacon.

H. L. Davis, three varieties of potatoes, and lots severally of barley, oats, and wheat.

Mrs. H. L. Davis, canned peaches, tomatoes, and plums; tomato catchup, and currant and raspberry wines; boiled cider, cider vinegar, and tomato pickles; and sixteen varieties of apples.

Mrs. Henry Kessler, currant and crabapple jellies.

Mrs. J. R. Kenyon, some blue plum jelly, trophy tomato, and a tea-pot two hundred and twenty years old.

J. R. Kenyon, two varieties of turnips and a mammoth wurzel beet.

Chas. Peters, a keg of lager beer.

E. Reichman, a sack of flour.

Master Willie Stine, some quinces and blue plums.

F. Riley, a lot of apples and white grapes.

J. A. Davidson, three varieties of potatoes, two of beets, and two of cabbage; lots severally of onions, corn, oats, and rye.

Mrs. J. Clarkson, damson, blue, and wild plum jellies; wild cherry, blackberry, crabapple, grape, and currant jellies; two varieties dried pears; green gage plums, wild plums, large blue plums, damson plums, and egg plums—all dried; two varieties of peaches, dried; three varieties of dried crabapples, corn, tomatoes, and wild plums; ten varieties of apples, egg plums, and two varieties pears; crabapple, peach, and currant preserves.

Mrs. Jesse Davis, dried—apples, tomatoes, corn, peaches, plums, currants, and pumpkin; jellies—apple and currant; canned—gooseberries, pears, blackberries, plums, tomatoes, cherries, and lard; plum preserves, tomato catchup, mango pickles, and a sack of wheat.

D. N. Lash, salt manufactured at salt works of Lash & McCann.

Nellie Jane Clarkson, collection of eggs.

Mrs. M. E. Hilt, fifteen varieties of grapes; eight of peaches; five of plums; seven of pears, and thirty-eight of apples; of dried fruit—four kinds of pears; five kinds of plums; four of peaches; nine of apples, and dried corn and currants; crabapple jelly and jam; honey; canned—fifteen kinds of fruit, cucumber pickles, tomato catchup, currant wine of eighteen hundred and seventy-three, and blackberry wine of eighteen hundred and seventy-three and eighteen hundred and seventy-four, cider vinegar, grape wine of eighteen hundred and seventy-three, white

wine of eighteen hundred and seventy-four, fresh butter, salt-rising bread, box of tomatoes, two varieties of beans, hops, three varieties of potatoes, plum butter, crabapple butter, and jam; eight kinds of jelly and three of syrup. In addition to the above there is by the same exhibitor, pencil drawing, hearth-rug, shell basket, bead basket, lamp mat, and crib quilt.

Mr. C. S. Moore, three varieties of squashes, three Yankee pumpkins, two varieties of beets, currant wine of eighteen hundred and sixty-nine, lot of carrots, and three varieties of potatoes.

Henry Hazlitt, twenty-seven varieties of apples, five of pears, four of peaches, two of plums, quinces, four varieties of corn, Chinese Winter radish, two varieties of cabbage, four varieties of potatoes, lot of onions and oats.

Mrs. M. Fultz, canned--apples, peaches, blackberries, cherries, cranberries, plums, and tomatoes; jellies—green grape, currant (two kinds), cherry, Siberian crab and plum; blackberry and plum jams and tomato catchup.

Miss Naomi Hazlitt, blackberry and quince jellies and canned quinces.

Mrs. C. P. Call, cider vinegar and hop yeast domestic bread.

Mrs. Elizabeth Chandler, quilt patchwork, fresh butter, honey, beeswax, cucumber pickles, mango peppers, honey vinegar, and tomato catchup; dried—pears, peaches, apples, plums (two kinds), nectarines, and yellow gages; sugar corn and onions.

Mrs. A. Iffland, jelly cake, pound cake, and fresh apricots.

Jos. Lang, wheat bread, soda and sugar crackers, rusks, Jenny Lind cakes, ginger snaps, rye bread, and Graham bread.

Mrs. Louisa Fried, a lot of purple pickled cabbage.

Miss Emma Clyde (fourteen years old), a lot of spiced currants, some plum jelly, and a tidy crochet.

Mr. C. D. Fowle, the "Champion Churn."

Thos. Orr, forty-four pounds canned butter and a box of honey.

Mrs. Thos. Orr, some cider vinegar, quilt patchwork, quilt log cabin, and wool tidy, worsted crochet work.

Mrs. Jas. Vance, Ben. Butler cucumber.

Mr. J. B. Rohrer, sack barley and oats.

M. Slater, lot of fresh butter.

Master Eddy McConnell, Brahma chickens, five months old.

Mrs. W. Bisbee, jellies—blackberry, crabapple, white currant, and red currant; two bouquets of flowers.

Miss Jenny Clyde (eleven years old), some hop yeast bread.

Mrs. Chas. Lind, tomato catchup.

Mrs. Jacob Martin, currant and crabapple jellies, and canned peaches, pears, and cherries.

W. McConnell, cheese.

F. J. King, samples of dairy, packing, and stock salt.

Mrs. Louisa Hart, cider vinegar, tomato catchup, cucumber pickles, canned plums and peaches; jellies—blackberry, crabapple, and wild plum; dried—peaches, plums (two kinds), pears (three kinds), and apples.

Mrs. A. Shepard (seventy-three years old), a lot of homespun yarn.

Mrs. W. J. Evans, canned plums, and plum and blackberry jellies.

W. J. Evans, eleven varieties of apples and two of plums.

Mrs. L. Wright (fifty years old), home-made knit socks and stockings, and gloves; five packages double and twisted yarn; a lot of rolls.

Mrs. E. V. Brown, crabapple jelly.

Master Alex. Rosborough, a pencil drawing.

The Sisters of Mercy, one sample of bead and three of worsted work.

Miss Carrie Jones (nine years old), sofa pillow, bead pincushion, Bible marks, and air castles.

Mrs. J. M. C. Jones, air castles.

Mrs. Fred. Taylor, rose and lily tidy, worsted work, pansies, toilet work.

Miss Nellie Heard, horn basket.

Mrs. S. Autenreith, slipper holder and watch holder.

Mrs. Cornelius Haight, pencil drawing.

Miss Minnie Winckler, knot work.

Mrs. E. H. Schofield, crochet tidy.

B. F. Smith, two oil paintings—one of Mount Shasta, and one Castle Rock.

Mary Pashburg (five years old), curtain holders, crochet work.

Mrs. John Pashburg, two crochet tidies, and infant's gown—applique work.

P. G. Strickland, one case of assorted gloves.

Miss Sophie Winckler, bead hanging basket.

Mrs. Van Choate, display of pansies and cut flowers.

Miss Belle Skinner, display of cut flowers.

Miss Anna Fried (ten years old), patchwork, crochet collars and lace.

Miss May Carrick, braided tidy.

Miss Minnie Kaster, bead mat and two crochet tidies.

Mrs. G. F. Davis, a crochet tidy.

Miss Mary Witherill (eleven years old), a set of underclothes.

Miss Katie Remme (twelve years old), pincushion—beadwork—and pillow case and pillow case cover.

Miss Addie Clarkson, beadwork.

Mrs. F. Rogler, meshed netting.

Miss Katie Lunker, raised work.

Mrs. A. W. Niles, pencil drawing, hearth rug, shell basket, bead basket, lamp mat, crib quilt.

Miss Mattie Pyle (ten years old), crochet tidy.

Miss Anna Kelsch (eleven years old), braided child's suit, and raised biscuit.

Miss Katie Hessenauer (seven years old), pincushion.

Josephine Hessenauer (seven years old), pincushion—canvas work.

Miss Anna Ryan (twelve years old), crochet cuffs, bead pocketbook, cover for footstool—worsted.

Miss Pearl Brown (thirteen years old), two pairs cuffs—worsted work, two scarfs, and crochet lace.

Miss Kate Brown, tatting collar.

Miss Emma Schlagel, pincushion and watch case, both beadwork.

Miss Louisa Schlagel, beadwork pincushion.

Mrs. Nordheim, quilt patchwork and potato starch.

Miss Maggie Combs, pillow slips—knit crochet, and quilt patchwork.

Miss Mary Combs, quilt scrap.

Miss Maggie Allen, drawed rug.

Miss Emma Schlagel (twelve years old), hanging basket and plants.

Mrs. Jos. Lang, hanging basket and geranium.

Mrs. Charles Hammond, braided suit—three pieces—for child, made by hand; tatting and tuck, braid by hand; lady's chemise and night dress, made by hand; child's night dress, by machine; child's sack, silk braid, by hand, and child's apron, hand work.

Mrs. David Horn, two quilts—one white, one fancy work; fine shirt, made by hand; gent's drawers and undershirt, made by hand; lady's undersuit, three pieces, machine work.

Mrs. W. Bisbee, slipper case, applique.

Miss Lena Bisbee (seven years old), embroidered tidy, and hair-pin box, crochet work.

Miss May Wetzell, two crochet tidies.

Miss Emma Clyde (thirteen years old), child's afghan.

Miss Martha Knights (ten years old), worsted embroidery.

Miss Louisa Fried, tidy crochet and collar and lace crochet.

Miss Lizzie Nixon (nine years old), beaded pincushion.

Miss Mary Nixon (seven years old), shoe needlework, chenille card case, book marks.

Mrs. Sisson, straw flowers and crystallized grasses.

Mrs. P. C. Call, two willow baskets, corn husk braid, wheat straw braid, and coxcombs.

Miss Mabel Hazlitt, wheat straw braid.

Mrs. Iffland, child's dress—silk embroidery.

Mrs. W. McConaughy, infant's robe, machine work.

Miss Seavers, tidy.

Miss Ida Ranous, two samples knit lace, and tomato catchup.

Miss May Green, bouquet of dahlias.

Mrs. Inez Wheeler, silk quilt, two crochet lamp mats, pair pongee lamp mats, pair coral lamp mats, and mat and tidy—raised crochet work.

Mrs. May Stringer, quilt, log cabin.

Mrs. E. Ranous, braided rug.

Miss Nellie Conroy (seven years old), embroidered honeycomb cloth.

Miss Mary Conroy (six years old), embroidered honeycomb cloth.

Mrs. H. B. Warren, silk embroidery.

Miss Nettie King (fourteen years old), oil painting.

Miss Clara Hovey, cut flowers—purple amaranth and immortelles.

Miss Gussie Ringe (eight years old), three samples crochet work.

Miss Mary Greenough, display of cut flowers, cotton crochet edging, and thread tidy.

Miss Tena Klinge (six years old), cotton crochet.

Mrs. A. Klinge, crochet nightcap.

Mrs. J. Pashburg, groups of verbenas and dahlias.

John Hilt, show case, cabinet work.

J. C. Tolman, of Jackson County, Oregon, had on exhibition a miscellaneous lot of leather, tanned at his tannery, embracing harness, skirting, black bridle, fair bridle, grained black upper, buffed upper, waxed upper, waxed kip, waxed calfskin, grained black calfskin, and black buckskin.

ANNUAL ADDRESS.

The following is a copy of the annual address delivered before the Siskiyou Agricultural Society, in Yreka, by Judge E. Shearer, on Friday evening, October ninth, eighteen hundred and seventy-four:

Mr. President, ladies and gentlemen:

Again we have assembled for the purpose of holding the annual meeting and making the annual exhibition of the Siskiyou County Agricultural Society. Doubtless the question has been asked, why have the society selected, for the purpose of delivering the address customary on this occasion, one who, it is reasonable to suppose, has had no practical experience on the subject of which he is expected to treat. I am free to admit, in regard to this matter, that I feel out of place, and the only solution that I can give is, that the Directors could find no one else who possessed the hardihood to undertake the task, and in selecting me, they acted upon the principle that the sailor does in making a virtue of necessity, and entering "any port in a storm."

I shall endeavor to suggest to you some few considerations which I deem practicable and important in the future management of your individual interests, believing that the advancement and prosperity of our county rests now mainly on that portion of our population engaged in agricultural pursuits, for the reason that the other branch of industry to which we were wont to look in earlier times for support—to wit: the mining interests—has for years past been on the decline, and of the miners, to a great extent, it may with truth be said, that "Othello's occupation 's gone." Not that I would have you suppose that I believe that the precious metal has been exhausted in the mines now being worked, and that new discoveries thereof may not be made in our mountains and gulches, but experience has taught us that the yield therefrom for a series of years last past has been greatly diminished, and to such an extent that we cannot look for such a return for the labor therein expended, as to persuade us to look thereto and rely thereon as a basis for advancement and pecuniary prosperity, as we did in former years.

We have been pleased by an inspection of the various articles exhibited in this Pavilion, and can speak in praise of the skill of those whose handiwork has been employed in their preparation. At the Fair grounds we have had an opportunity of observing the symmetry of form and general comeliness of improved breeds of various kinds of stock; and we have also witnessed trials of speed on the race course. But this observation alone is of no material advantage, if we shall stop only at the gratification of beholding the spectacle, without the disposition to learn something therefrom, and to emulate those who have taken the trouble and incurred the expense thereof. How, then, shall the advantages resulting to those who have been engaged in, and have succeeded

in improving the order of things pertaining to agricultural pursuits, be brought within the attainment of others ordinarily engaged in the same vocation?

It is for the accomplishing of this that agricultural societies are established. Has this society ever adopted any plan by which they expect to effect that object? I think not. We know it to be a fact that one farmer raises a larger number of bushels of grain per acre than another, and yet their lands seem to be equally fertile, and their irrigating privileges seem to be equal. Now, it is desirable to know the cause of this difference. In other words, let the knowledge of the best method of cultivating the soil be brought within the reach of all who desire that kind of information. Would it not, therefore, be judicious on the part of your Directors, to not only offer inducements to exhibitors by an award of prizes to successful ones, but also hold out similar inducements to those who come forward and make statements in regard to their method of cultivating, so that the views and experience of those whose success is satisfactory, may be known, and an opportunity offered to all who desire to avail themselves of the information, and thus acquire a knowledge of how to successfully cultivate the soil—and the failure to make such offers, and hold out such inducements, is not alone characteristic of this agricultural society, for I have no recollection of any such inducement having been offered, either by the State Agricultural Society or the agricultural society of any of the counties of the State. In short, what is needed in this particular, is an interchange of opinion amongst our farmers, and a statement of their experience and observation, the one to the other. In looking back over the experience of the last eight years, can we flatter ourselves that our condition is an improved one in an agricultural point of view? Can we say that each one has, year by year, added something to his interest, pecuniarily speaking; and have you a satisfactory assurance that in the future the prospect is such as to induce you to believe that there is a better time coming? Do the prices received for hay and grain encourage you to put an increased acreage in such productions? If not, what then do you propose to do? If the industrial methods which you have heretofore been engaged in do not compensate by satisfactory returns, introduce new methods. What these new methods shall be, a glance at the present condition of the county may help to solve.

In looking squarely at our present condition financially, and asking the cause thereof, we are met by the reply, that the depletion of the mines, the limited market for home products, and the destruction of stock of various kinds by the inclemency of the past Winter, has brought us to it. Admit that this is so, should not the fact that such is the case be an incentive to increased energy, properly directed, to relieve you from embarrassment? Should not your experience in the loss of stock warn you against a recurrence of a similar calamity; and yet how many of you have taken the precaution against it? How many of you have prepared to meet it, we shall know only when the Winter is past. Does it not occur to you that the retaining and rearing of large herds of cattle is calculated of itself, in the exhausted state of stock ranges, to affect you financially? What in the continued levying of taxes upon and the loss by actual starvation of this non-available species of property do you promise yourselves? Would it not be to your advantage to sow more grain, raise more hay, and after disposing of what you could at such prices as you might obtain for it, for the purpose of meeting such pressing demands as may be made on you,

appropriate the residue to fattening your stock, in such numbers only as you can do justice to, and be in the market ready to meet such demands as may be made to supply the requirements of the lower country markets? When, during any past Fall and Winter for several years back, have purchasers of beef cattle failed to come among us? Perhaps you are apprehensive that you may stock the market in one season, and that your fatted cattle, after consuming your provender, may remain on your hands. That would imply that the consumption of beef, in your estimation, would either cease altogether, or else be diminished to that extent as to make the fattening of cattle for beef unprofitable. Whether such a conclusion is wise or otherwise, I leave for your own determination. In my judgment, here is wherein lies the misfortune in this matter; but few of our farmers seem to have exercised judgment in pursuing the course suggested, and there is too great a tendency to demand exorbitant prices for the commodity, instead of disposing of it at such prices as enable them to realize a fair return for the investment employed for fitting it for market; hence the result is, that purchasers seek other markets, and this county, instead of becoming what it might be really made, one of the largest market grounds for the sale of beef cattle, is allowed to drift into bankruptcy for the want of the exercise of a proper judgment in not engaging in this, amongst others, of the industrial pursuits that may be properly followed.

Perhaps at this particular time there is, and for a while back there has been, but a limited demand for beef cattle. This is no doubt owing to the fact that in the lower country, where the so-called "no fence" law prevails, the owners of stock being compelled to take care of by herding their cattle, have found that a continuance in the business of stock raising will not be profitable in the future, and are offering their stocks as beef at such low rates in order to rid themselves of them, and quit the business, as induces dealers to invest, for the time being, below; but this trade cannot, in the nature of things, last long, and they will be compelled to look elsewhere for supplies. This delay will only enable you, by proper management, to meet the demand, and will doubtless inure ultimately to your advantage. The real trouble is that you own *too much* of this kind of stock, and you have labored under the erroneous idea that the more stock you owned the better off you were pecuniarily, when in truth and in fact the more stock you own, over and above what you can feed and properly care for, only renders you poorer, for the reason that it only increases your taxes, is too poor for sale, and finally dies on your hands from starvation.

There is another species of property owned by some of you, and which has been and always will be a curse to any county where it is owned—and that is the breed of Cayuse horses. Perhaps no one is willing to admit that he owns any of that kind of stock, and therefore the large bands of them to be seen on all the stock ranges in the county are without owners; yet, let some one undertake to confer a benefit to the county by riding off one of them, and see how quickly the services of the Grand Jury will be brought into requisition—for the Legislature of this State, in their wisdom, did not see the advantage that would result in excepting Cayuse horses when they made it a crime punishable by imprisonment in the State Prison to steal a horse! And yet of what benefit are they? Too small and trifling to be put to any kind of work, they cannot be salable, and yet they are allowed to increase; yea, multiply; to eat out the range, and thereby drive out stock which might be made profitable if you were only allowed the use of the range to raise

them on. Still you may realize something from them—but only in one way that I can conceive of—and that is to kill them off and sell their hides to be converted into leather. In short, get rid of your scrub stock of every sort at the best advantage offered. With the opportunity offered by the importation into our county of thoroughbred cattle, and of first-class horses, for the purpose of propagating, there is no excuse for any one failing to procure graded cattle and horses in every way suitable for farming and other purposes, and that will at any time command remunerative prices, either sold at home or sent elsewhere for that purpose. Look at our neighboring county in the State of Oregon, and recollect the length of time back in which she has supplied us more or less with good horses—and to this day it is the fact that purchasers seeking good horses for farm purposes, or even fancy stock, go into Jackson County to make their purchases; all of which is a dead loss to us, for the reason that the money necessarily expended in making these purchases is distributed elsewhere, instead of being paid out to us, and thereby brought into general circulation in our midst; and for this, you, my farmer friends and stock raisers, have no one to blame but yourselves—the result of your want of reflection, your carelessness, and your indifference on the subject.

There has been and still seems to be an antagonism between cattle and horse breeders and sheep owners in the county, for the reason that cattle and horses will not, it is stated, feed on the same range with sheep. I shall leave this matter to be reconciled between you as best you may be able to, believing that whenever it is deemed to be profitable to you to breed sheep, that sheep raising will be engaged in by you to whatever extent you may deem it advisable, whether on a great or small scale, without regard to whether it suits the breeders of other kinds of stock or not, as there can be no class legislation on this subject, excluding any kind of domestic animals from the limits of this or any other county in the State. The importance of the wool-growing interest is known to you all. The statistics, State and National, furnished on this subject, show that it is a great and increasing source of material wealth, and to dismiss this branch of my address let me urge upon you, that should you incline to this branch of industry, by all means procure the best stock of the various improved breeds that you can obtain, for we have too many of the mangy and scabby kind already.

There is another branch of industry which has been entirely and utterly neglected in this county, and yet our friend Judge Tolman, of Oregon, has shown and actually demonstrated to us that it may be followed to advantage. Why, then, is it that the tanning trade has not been engaged in? You possess the same facilities therefor that he does—the material for the process is furnished in abundance on every hillside. A ready sale for hides could be furnished at your very doors, and thereby a traffic would spring up amongst yourselves, and money could be kept in the county, when, as matters now stand, you deplete your own finances by being compelled, for the want of energy and good judgment, to purchase from abroad, thus sending money out of the county which could be retained and distributed amongst ourselves. What reason is there for his conducting this business so successfully, as evidenced by his continuance thereof, that would not hold good in case you should undertake it? Have you not the same facilities for employing skilled operatives in the business that he has? There is no reason why this

branch of business cannot be successfully and profitably engaged in in this county—the real drawback consists in your unwillingness to risk money in the investment.

The Clear Lake Dairy has a reputation that of itself is a guarantee of wealth; resulting from the business there prosecuted—and what is there to prevent you from establishing dairies here that can compete with that one, far-famed as it is? Have you ever known the time here when "A No. 1" first class cheese did not find ready sale in the county? Is there no longer a demand for first quality butter? Certainly those two great essentials are required in the world's domestic economy to as great an extent as they ever were, and yet men have grown wealthy in the production of these articles when the population of the world was more limited than it is at the present time. Yet you will find men ready to state that the yield from twenty-five cows will supply the entire demand of Yreka, and that one ordinary sized dairy will glut the market in the whole county. To them I have only one reply, viz: that their vision is limited to the horizon that overhangs the boundaries of Siskiyou County only.

A few suggestions, on general principles, and I will leave the subject with you. Take good care of all that you have. See that nothing is lost from want of proper care and attention. Why is it that dealers find it profitable to import garden seed from the East? Because you buy from them from year to year. We live in a far more fertile latitude, are blessed with longer seasons, and a more genial climate. Yet you supply yourselves with imported seed, when your own vegetables fall to the ground from whence they sprang, unnoticed and uncared for. Carry this same survey into your fields, and how much greater and more serious becomes the waste! Tons of straw suffered to bleach and wither away, your cattle perishing for want of Winter supplies, and all grumbling over tough and unpalatable beefsteaks. Again, buy only what you need, and at the time that you need it, and buy always the best articles that you can afford. It is the poorest economy to buy cheap and indifferent goods, either for food or clothing. The physicians' bills, and the repeated demands for new supplies, will make the cheap bargains by far the most costly in the end. Try to have a place for everything, and keep everything in its place. Endeavor to have a time for everything, and do everything in its proper time. A continual clashing of employment is the surest way to produce disorder and confusion. A word here to the female head of the house—never engage in other employment to the neglect of breakfast, dinner, and supper. If you do, I'll guarantee that you will have a frowning and complaining household.

The advantages to the leading pursuits of mankind, and to all of the important interests of society, from an enlightened and advancing system of agriculture, is a proposition the truth of which is so patent that it needs no argument to establish it. But we cannot hope for the inauguration of such a system, nor even for the success of individual farmers, until those who are engaged in tilling the soil are well informed in the theory and practice of their pursuit; and without at all detracting from the value of good papers and books on agricultural topics, I assert that the knowledge most useful to farmers generally is that derived from experience and observation. But as the experience and observation of no single individual embraces every department of farming, and the innumerable modes and expedients resorted to in order to secure desired results, it follows that there must be an interchange of

opinions and convictions to render available the practical knowledge in the possession of many.

It cannot be successfully controverted that, all other conditions being equal, the enterprising, industrious man, who reads and reflects, and seeks to inform himself concerning the principles and practices of the pursuit in which he is engaged, will be enabled to make greater progress, and render it more attractive and profitable, than one who plods along in an old routine, contented in his ignorance, and making no effort toward improvement.

Whatever stimulates thought, other things being equal, induces thrift. An unthinking farmer cannot be prosperous, because without thought there can be no method, and without method there can be no success on the farm. Reading suggests subjects of thought, and this, added to the practical skill of the farmer, often produces valuable results. It is only the uneducated and those who do not read, that decry agricultural journals and agricultural works, and, of course, are ignorant of what they condemn. Their judgment in the matter is worth nothing, because it does not rest upon competent knowledge. A farmer is often successful though he may not read, but it does not follow that he does not think. Such an one might have been still more successful had his horizon of thought been enlarged by a systematic course of reading. Every man feels instinctively that the greater the amount of knowledge that he can bring to bear on his business, the greater will be his success, provided the same exertion is used in the one case as in the other. It is absurd to say that it is a disadvantage to one's business to learn all he can about his business; and yet there are some persons who maintain that reading about farming is of no profit, though these same persons will often ask and follow the advice of competent farmers in their neighborhood; in other words, according to them, the advice is good if conveyed orally, but if communicated on printed pages it is worthless.

As the light of knowledge advances, the clouds of ignorance, error, and prejudice are dispelled, and science, with its ever-widening and ever-varying horizon, throws forth light upon every department of human industry, and, most of all, upon the business of agriculture. Within the past forty years it has advanced from an ignoble art to a dignified science, and farmers should know and feel and appreciate, that in all these movements it magnifies their calling, elevates them socially, and advances their material prosperity. The greatest enemy to the farmer is the farmer himself. Were he to show an eagerness and anxiety for the elevation of his vocation, it would rank with any and all other professions, for no occupation is so well calculated to keep in equilibrium all the powers of the mind and body. It calls forth the most varied qualities: patience, care, and diligence; zeal, industry, and economy; tact and skill to direct and manage—no faculty of the intellect or power of muscle or feeling of the heart, but what is brought into requisition by the successful farmer.

Deep science and pliant art must unite in him. He must not only know how to direct, but he must know how to execute. Let them train and prepare themselves by increased knowledge for the brilliant future that lies open before them, and take the position which it was intended for them to occupy.

Agriculture is the foundation of all the arts of civilization, the support of commerce, the groundwork of national wealth, the prop and stay and substratum of public morals and national strength. It implies

an ownership in the soil and consequent patriotism. Whatever class owns the land of a country should feel the highest regard for the material interest of the country, and in the enforcement of laws for the preservation of peace and the protection of persons and property in the country. They should be educated and instructed so as to advance the standard of civilization, and exert those humanizing influences which distinguish the cultivated man from the ignorant savage. More knowledge, more light and social position, should be the aim and end of every farmer in the land.

TRANSACTIONS

OF THE

BAY DISTRICT FAIR GROUND ASSOCIATION,

FOR

THE YEAR 1874.

FINANCIAL REPORT.

Dec. 31st...	To total receipts 1874, including memberships.....	$125,411 62	
	Disbursements.		
Dec. 31st...	By amount paid purses to races	.....	$38,400 00
	By amount paid premiums.....	.....	5,123 00
	By amount paid for improvement of grounds.....	.....	50,000 00
	By amount paid for improvement of club house.....	.....	11,067 25
	By current expenses.....	.....	15,941 12
	By cash on hand.....	.....	4,880 25
		$125,411 62	$125,411 62

PREMIUMS AWARDED.

HORSES.

Exhibitor.	Residence.	Animal.	Premium.
George Treat	San Francisco	Best thoroughbred stallion, four years old and over, Thad. Stevens	$75
John Hall	Alvarado	Best thoroughbred stallion, three years old and over, Tom	$50
R. T. O'Hanlon	San Francisco	Best thoroughbred stallion, two years old, Turf Gallery	$40
John Hall	Alvarado	Best thoroughbred stallion, under one year, Basswood	$20
John Hall	Alvarado	Best thoroughbred mare, four years old and over, with colt, Moss Rose and colt	$60
John Hall	Alvarado	Best thoroughbred mare, four years old and over, Peggy Ringgold	$50
John Hall	Alvarado	Best thoroughbred mare, three years old, Bell Morey	$40
John Hall	Alvarado	Best thoroughbred mare, two years old, Lady Washington	$30
John Hall	Alvarado	Best thoroughbred mare, one year old, Rosewood	$25
John Hall	Alvarado	Best thoroughbred mare colt, under one year, no name	$20
John Hall	Alvarado	Best thoroughbred dam, with not less than four of her colts, all thoroughbred, Moss Rose and colts	$100
Claus Spreckles	San Francisco	Best stallion, other than thoroughbred, with not less than ten of his colts, Speculation and colts	$100
William Hamilton	San José	Best dam, other than thoroughbred, with not less than three of her colts, Winona and colts	$50
David Bery	Oakland	Best graded stallion, four years old and over, Henry Williamson	$50
James Rickards	San Francisco	Best graded stallion, two years old, Charles Dickens	$30
L. Atkinson	San Francisco	Best graded stallion, one year old, Captain Kohl	$20
William Hamilton	San José	Best graded mare, four years old and over, Santa Clara	$40
M. L. Brittan	San Mateo	Best graded mare, four years old and over, with colt, Ida Martin and colt	$50
John Martin	San Francisco	Best graded mare, three years old, bay filly	$30
William Hamilton	San José	Best graded mare, two years old, Fanchon	$20
William Hamilton	San José	Best graded mare, one year old, Kate	$15
William Hamilton	San José	Best stallion of all work, three years old and over, Justice	$40

HORSES—Continued.

Exhibitor.	Residence.	Animal.	Premium.
William Hamilton...	San José.....	Best stallion of all work, two years old, Tom Scott.....	.....$30
C. A. Sessions.....	San Francisco..	Best stallion of all work, one year old, Coal Bunker.....	.....$20
R. Ashburner	Baden Station...	Best mare of all work, three years old, Blossom.....	..... $20
William Hamilton...	San José.....	Best mare of all work, two years old, Emma.....	.....$15
M. L. Brittan.....	San Mateo.....	Best draft stallion, four years old and over, Lord Poole.....	....$50
McCarty & Lapham.	San Francisco..	Best draft stallion, three years old, Judge Templeton.....	.....$30
M. L. Brittan.....	San Mateo.....	Best draft mare, four years old and over, with colt, Dolly and colt.....	.....$40
M. L. Brittan.....	San Mateo.....	Best draft mare, four years old and over, Gypsy	.....$35
Al. Whipple...	San Francisco..	Best roadster stallion, four years old and over, Hambletonian, Jr.	.....$75
Mackey & Dutch.....	San Francisco..	Best roadster stallion, three years old, Billy Carr.....	....$40
C. W. Kellogg.....	San Francisco..	Best roadster gelding, four years old and over, Mountain Boy.....	Sil. pitcher—$60
William Hamilton...	San José.....	Best roadster mare, four years old and over, Fanny Allen.....	.....$40
B. H. Coit...	San Francisco..	Best roadster mare, three years old, Tomboy.....	....$30
C. W. Kellogg.....	San Francisco..	Best matched span of carriage horses, Jim and Prince.....	Sil. goblet—$50
W. B. Carr	San Francisco..	Best double team roadsters, Billy and Jinks.....	S. pitcher—$100
Jeff. Bridgford.....	Paris, Mo.....	Best saddle horse, Dick Taylor...	.....$40
William Hamilton...	San José.....	Best graded horse colt, Black Allen.....	.....$30
J. D. Carr.....	Gabilan.....	Best sucking horse colt, Echo.....	.....$20
William Hamilton...	San José.....	Best yearling mare colt, Susie.....	.....$20
William Hamilton...	San José.....	Best sucking mare colt, Young Winona.....	....$15
William Hamilton...	San José.....	Best exhibit of not less than six colts, family of six.	.....$50
George Treat.....	San Francisco..	Best sweepstakes stallion, Thad. Stevens.....	S. pitcher—$100
J. D. Carr.....	Gabilan.....	Second best sweepstakes stallion, Carr's Membrino.....	Sil. pitcher—$50
John Hall.....	Alvarado	Best sweepstakes mare, Peggy Ringgold	Sil. pitcher—$75
J. D. Carr.....	Gabilan.....	Best stallion, other than thoroughbred, with seven of his colts	Spec. prem—$25
.....	.....	Best appearing horse and rider, rider of Thad. Stevens and horse	Silver cup—$25
John Hall.....	Alvarado	Most meritorious exhibit in thoroughbred horses.....	Sil. goblet—$25

Special premium recommended to William Hamilton, for Ethan Allen and colts.
Diploma recommended to Membrino and colts.

CATTLE.

Exhibitor.	Residence.	Animal.	Premium.
Jeff. Bridgford	Paris, Mo	Best Durham bull, four years old and over, Muscovite	$75
S. B. Emerson	Mt. View	Second best Durham bull, four years old and over, Sheriff	$30
C. Younger	Santa Clara	Best Durham bull, three years old, Tempest	$30
John Judson	Sonoma	Second best Durham bull, three years old, Grand Turk	$15
Carr & Chapman	Gabilan	Best Durham bull, two years old, Gov. Booth	$20
M. Wick	Oroville	Second best Durham bull, two years old, Orlando	$10
Carr & Chapman	Gabilan	Best Durham bull, one year old, 6th Lord Oxford	$15
Jeff. Bridgford	Paris, Mo	Second best Durham bull, one year old, Cornell	$7
C. Younger	Santa Clara	Best Durham bull calf, Red Thorndale	$10
M. Wick	Oroville	Second best Durham bull calf, Prince Albert	$5
Carr & Chapman	Gabilan	Best Durham cow, four years old and over, Lady Solway	$75
Jeff. Bridgford	Paris, Mo	Second best Durham cow, four years old and over, Jennie McLean	$20
C. Younger	Santa Clara	Best Durham cow, three years old, Jennie	$30
Carr & Chapman	Gabilan	Second best Durham cow, three years old, Hope 22d	$15
Carr & Chapman	Gabilan	Best Durham cow, two years old, Pet of Geneva	$20
Jeff. Bridgford	Paris, Mo	Second best Durham cow, two years old, Cora Lee	$10
C. Younger	Santa Clara	Best Durham cow, one year old, Forest Rose	$15
Jeff. Bridgford	Paris, Mo	Second best Durham cow, one year old, Lady Meldon	$10
C. Younger	Santa Clara	Best heifer calf, Hester Ryan	$10
C. Younger	Santa Clara	Second best heifer calf, Rosa Nell	$5
Jeff. Bridgford	Paris, Mo	Best herd of thoroughbred cattle, bull and four cows, two years old and over, Muscovite and four cows	$150
J. D. Carr	Gabilan	Second best herd of thoroughbred cattle, bull and four cows, two years old and over, Gov. Booth and four cows	$75
C. Younger	San José	Best bull and four cows, under two years, Arthur Lemon	$150
Jeff. Bridgford	Paris, Mo	Second best bull and four cows, under two years, Cornell and four cows	$75
A. Whipple	San Francisco	Best graded cow, four years old and over, Mary Ann	$30
C. Clark	Milpitas	Best graded cow, three years old, Mollie	$20
R. Ashburner	Baden Station	Best graded cow, two years old, Dahlia	$15
S. B. Emerson	Mt. View	Best graded cow, one year old, Fairy Queen	$10
C. Clark	Milpitas	Best graded heifer calf, Mollie 1st	$10
R. Ashburner	Baden Station	Best milch cows, Cleopatra and Sarah	$25
Wm. Fleming	Napa	Best Devon bull, three years old, Earl of Leicester	$30
S. Daniels	Lakeville	Best Devon bull calf, Tilton	$10
S. Daniels	Lakeville	Best Devon cow, four years old and over, Fashion	$75
Wm. Fleming	Napa	Second best Devon cow, four years old and over, Victoria	$20

CATTLE—Continued.

Exhibitor.	Residence.	Animal.	Premium.
Wm. Fleming	Napa	Best Devon cow, one year old, Queenie	$15
J. B. Haggin	San Francisco	Best Alderney and Jersey bull, four years old and over, Dashwood	$75
A. Mailliard	San Rafael	Best Alderney and Jersey bull, two years old, Keystone	$20
J. B. Haggin	San Francisco	Best Alderney and Jersey bull, one year old, Billy Dashwood	$15
J. B. Haggin	San Francisco	Best Alderney and Jersey bull calf, California Hero	$10
A. Mailliard	San Rafael	Best Alderney and Jersey cow, four years old and over, Cora	$75
J. B. Haggin	San Francisco	Best Alderney and Jersey cow, three years old, Nelly Bly	$30
A. Mailliard	San Rafael	Best Alderney and Jersey cow, two years old, Flora Dell 2d	$20
A. Mailliard	San Rafael	Best Alderney and Jersey cow, one year old, Bloomer 3d	$15
A. Mailliard	San Rafael	Best Alderney and Jersey heifer calf, Romana 2d	$10
S. B. Emerson	Mt. View	Best Holstein bull, four years old and over, Opidas 8th	$75
		Sweepstakes.	
Jeff. Bridgford	Paris, Mo	Best bull of any age or breed, Muscovite	$125
S. B. Emerson	Mt. View	Second best bull of any age or breed, Sheriff	$75
Carr & Chapman	Gabilan	Best cow of any age or breed, Lady Solway	$125
C. Younger	San José	Second best cow of any age or breed, Valley Maid	$75
C. Younger	San José	Best bull and five calves, under one year, Thorndale and calves	$100
R. Ashburner	Baden Station	Second best bull and five calves, under one year, Water Prince and calves	$50
Dean & Co	San Francisco	Best fattened bullock, Jim	$20
Jeff. Bridgford	Paris, Mo	Most meritorious exhibition on the ground, entire herd	Gold medal.

SHEEP.

Exhibitor.	Residence.	Animal.	Premium.
Severance & Peet	Niles Station.	Best Spanish merino ram, two years old and over—Green Mountain	$30
Severance & Peet	Niles Station.	Best Spanish merino ram, one year old and under two—Seville	$20
B. F. Watkins	Santa Clara	Second best Spanish merino ram, one year old and under two—Hero	No prem.
Severance & Peet	Niles Station.	Best three Spanish merino ram lambs—Pen of three	$20
Severance & Peet	Niles Station.	Best five ewes, two years old and over—Pen of five	$20

SHEEP—Continued.

Exhibitor.	Residence.	Animal.	Premium.
Severance & Peet	Niles Station.	Best five ewes, one year old and under two—Pen of five	$20
Severance & Peet	Niles Station.	Best five lambs—Pen of five	$20
B. F. Watkins	Santa Clara	Second best five lambs—Pen of five	$10
Severance & Peet	Niles Station.	Best ram and five of his lambs—Big Leg and five lambs	$30
Wm. Blacow	Centerville	Best French merino ram, two years old and over—Gamester	$30
Wm. Blacow	Centerville	Best French merino ram, one year old and under two—Sultan	$20
Wm. Blacow	Centerville	Best three French merino ram lambs—Pen of three	$20
Wm. Blacow	Centerville	Best five French merino ewes, two years old and over—Pen of five	$20
Wm. Blacow	Centerville	Best five French merino ewes, one year old and under two—Pen of five	$20
Wm. Blacow	Centerville	Best five French merino ewe lambs—Pen of five	$20
Wm. Blacow	Centerville	Best French merino ram and five of his lambs—Gamester and five lambs	$30
S. B. Emerson & Co.	Mt. View	Best Cotswold ram, two years old and over—One buck	$30
John Judson	Bloomfield	Second best Cotswold ram, two years old and over—One buck	$20
Landrum & Rogers	Watsonville	Best Cotswold ram, one year old and under—One buck	$15
Landrum & Rogers	Watsonville	Best three Cotswold ram lambs—Pen of three	$20
John Judson	Bakersfield	Second best three Cotswold ram lambs—Pen of three	$20
John Judson	Bakersfield	Best pen of five Cotswold ewes, two years old and over—Pen of five	$10
Emerson & Co.	Mt. View	Second best pen of five Cotswold ewes, two years old and over—Pen of five	$20
Emerson & Co.	Mt. View	Best pen of five Cotswold ewe lambs—Pen of five	$10
Emerson & Co.	Mt. View	Best Cotswold ram and five of his lambs—Pen of five	$20
L. Pierce	Suisun	Best Shropshire ram, two years old and over—Jack	$30
L. Pierce	Suisun	Best pen of five Shropshire ewes, two years old and over—Pen of five	$20
L. Pierce	Suisun	Best Shropshire ram and five of his lambs—Ram and five lambs	$30
Smith & Chapman	Merced	Best Leicester ram, two years old and over—Lord Derby	$30
Smith & Chapman	Merced	Best pen of five Leicester ewes, two years old and over—Pen of five	$20
Smith & Chapman	Mereed	Best Leicester ram and five of his lambs—Lord Leicester and five lambs	$30
J. D. Carr	Gabilan	Best Southdown ram, two years old and over—Fordham	$30
George Bement	Napa	Second best Southdown ram, two years old and over—Hudson	$15
George Bement	Napa	Best Southdown ram, one year old and under two—Sidney	$20
J. D. Carr	Gabilan	Best three Southdown ram lambs—Pen of three	$20
George Bement	Napa	Second best three Southdown ram lambs—Pen of three	$10
J. D. Carr	Gabilan	Best Southdown ram and five of his lambs—Pen of five lambs	$30
George Bement	Napa	Best five ewes, two years old and over—Pen of five	$20

SHEEP—Continued.

Exhibitor.	Residence.	Animal.	Premium.
George Bement	Napa	Best five ewes, one year old and under two—Pen of five	$20
J. D. Carr	Gabilan	Best five ewe lambs—Pen of five	$20
George Bement	Napa	Second best five ewe lambs—Pen of five	$10
L. Pierce	Suisun	Best graded ram, one year old and under two—One ram	$15
S. B. Emerson	Mt. View	Best pen of graded ewes, two years old and over—Pen of five	$10
L. Pierce	Suisun	Best pen of five graded ewe lambs—Pen of five	$15
		Sweepstakes.	
Severance & Peet	Niles Station.	Best ram and five of his lambs—Big Leg and five lambs	$75
Wm. Blacow	Centerville	Second best ram and five of his lambs—Gloucester and five lambs	$35

GOATS.

Exhibitor.	Residence.	Animal.	Premium.
N. Gilmore	El Dorado	Best Angora buck, two years old and over—Hannibal	$40
Landrum & Rogers	Watsonville	Second best Angora buck, two years old and over—Toby	$25
J. B. Sargent	Gilroy	Best Angora buck, under two years old—Aladdin	$30
N. Gilmore	El Dorado	Second best Angora buck, under two years old—Aladdin	$20
N. Gilmore	El Dorado	Best pen of three Angora does, two years old and over—Pen of three	$25
Landrum & Rogers	Watsonville	Second best pen of three Angora does, two years old and over—Pen of three	$15
Landrum & Rogers	Watsonville	Best pen of three Angora does, under two years old—Pen of three	$20
N. Gilmore	El Dorado	Second best pen of three Angora does, under two years old—Pen of three	$20
		Sweepstakes.	
N. Gilmore	El Dorado	Best buck—Hannibal	$50
J. P. Sargent	Gilroy	Second best buck—Teheran	$30
Landrum & Rogers	Watsonville	Best doe—Annie	$25
N. Gilmore	El Dorado	Second best doe—Cleopatra	$15

SWINE.

Exhibitor.	Residence.	Animal.	Premium.
R. S. Thompson	Napa	Best boar, two years old and over—Young Comet	$30
J. C. Mills	Centerville	Best boar, under two years old—Wellington, Jr.	$20
Charles Clark	Milpitas	Best boar, six months old and under one year—Jacot	$25
R. S. Thompson	Napa	Best sow, two years old and over—Beauty 2d	$25
R. S. Thompson	Napa	Best sow, one year old—Victoria 4th	$20
R. S. Thompson	Napa	Best sow, six months old and under one year—Berkshire Beauty	$16
R. S. Thompson	Napa	Best pair of pigs, from six to ten months old—Best pair	$30
R. S. Thompson	Napa	Best pen of ten pigs—Pen of ten	$30
		Sweepstakes.	
R. S. Thompson	Napa	Best boar of any age or breed—Young Comet	$40

F. W. HINCHMAN, Secretary.

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